
United States Circuit Court of Appeals,
FOR THE NINTH CIRCUIT. 3

BUTTE AND SUPERIOR MINING COMPANY,
Defendant-Appellant,
vs.

MINERALS SEPARATION, LIMITED, ET AL.,
Plaintiffs-Appellees.

ORAL ARGUMENTS FOR APPELLANT.

FILED
APR - 2 1913
F. D. MONTGOMERY
CL.

Opening Argument of J. Edgar Bull, Esq.

MAY IT PLEASE THE COURT :

This is an appeal from the decree of the District Court of Montana sustaining the patent in suit and finding infringement by the defendant in all its flotation processes up to the present time.

The patent in suit is the patent to Sulman, Picard and Ballot, No. 835,120, for a process of ore concentration. With the court's permission, I will hand up copies of the patent.

All of the claims of the patent, excepting 4, 8 and 13, are in issue.

JUDGE HUNT : All excepting claims 4, 8 and 13 ?

MR. BULL : All excepting 4, 8 and 13.

This court is already familiar with this patent. It was before it in the case of Mineral Separation, Limited, vs. Hyde, when this court held the patent invalid. That case went to the Supreme Court of the United States by *certiorari* ; and that court found certain claims of the patent to be valid ; it found other claims of the patent to be invalid. And, therefore, it very definitely and finally determined the metes and bounds of this patent here in suit.

That decision of the Supreme Court is the law of the land respecting the construction of this patent. So we begin this case, may it please your Honors, with that decision of the Supreme Court in the Hyde case already written into your Honor's opinion in this case.

I shall confine my argument to two points. In the first place I shall discuss the question of infringement. That will require your Honors only to study and apply the decision of the Supreme Court to the facts of this case. In the second place, I shall discuss the question of the disclaimer which was filed by these plaintiffs subsequent to the decision of the Supreme Court in the Hyde case. That question will require your Honors only to decide a pure question of law. My argument will be rigidly limited to these two points.

The process of the patent in suit is extremely simple. It consists in mixing powdered ore with water ; usually about one ton of ore is mixed with four or five tons of water,

forming a freely flowing pulp. An exceedingly small amount of oil is then added. That amount is stated in the patent as being between one-half of one per cent. and one-fiftieth of one per cent. on the ore. After this relatively microscopic quantity of oil is added, the pulp is agitated vigorously, and a froth forms on the top which carries most of the metalliferous contents; and when that froth is separated from the pulp, the process is completed. So the process is the essence of simplicity in itself.

Before the Supreme Court's decision was handed down, the defendant used this extremely small fraction of one per cent. which is described in the patent—about one-tenth of one per cent. of oil. Since the decision of the Supreme Court was handed down, defendant has always used oil in quantities of more than one-half of one per cent., and, for substantially the whole of the time, it has always used oil in quantities of more than one per cent. on the ore.

We admit that the earlier practice of the defendant (using oil in quantities less than one-half of one per cent.) was an infringement of this patent as sustained by the Supreme Court. But we contend that its later practice (using oil in quantities above one-half of one per cent.) did not infringe the patent, as it has been construed by the Supreme Court. So the nub of this controversy is the question whether the use of oil in quantities above one-half of one per cent. constitutes an infringement of the claims—the valid claims—of this patent, as they have been construed by the Supreme Court.

I will begin by reviewing very briefly the decisions of the various courts which have considered this patent. I will take them up in chronological order. But before I do that, I will ask your Honors to look at the claims of the patent and observe that they are divisible into two groups. I will begin by reading claim 1 :

“The herein described process of concentrating ores which consists in mixing the powdered ore with water, adding a small proportion of an oily liquid having a preferential affinity for metalliferous matter (*amounting to a fraction of one per cent. on the ore*), agitating the mixture until the oil-coated mineral matter forms into a froth, and separating the froth from the remainder by flotation”.

You will see that claim 2 contains that same phrase: "*amounting to a fraction of one per cent. on the ore*".

You will see that claim 3 contains that same phrase: "*amounting to a fraction of one per cent. on the ore*".

Claim 4 is not in issue.

Claim 5 contains the statement in line 4: "*amounting to 0.02-0.5 per cent. on the ore*".

Claim 6 contains the same statement: "*amounting to 0.02-0.5 per cent. on the ore*".

Claim 7 contains the same statement: "*amounting to 0.02-0.5 per cent. on the ore*".

Claim 8 is not in issue.

Now, if you will turn over to claim 12, you will see that claim contains the limitation, in line 4: "*amounting to a fraction of one per cent. of oil on the ore.*"

I will call that group of claims the "*fraction-of-one-per-cent.*" claims.

Now, if your Honors will look at claims 9, 10 and 11, you will see that they contain no reference to a "fraction of one per cent." They substitute, in place, the words, "*a small quantity of oil.*"

Claim 9, the last line, almost the last words of that line: "*containing a small quantity of oil.*"

Claim 10, the same words: "*containing a small quantity of oil.*"

Claim 11, contains the same words: "*containing a small quantity of oil.*"

I shall call that group of claims the "*small-quantity*" claims. They are not limited to a *fraction of one per cent.*; they are broad enough to cover *any small quantity* of oil.

Now, this patent first came before the District Court of Montana in the Hyde case. That court did not regard the use of this fraction of one per cent. of oil as of the essence of the invention. It regarded the invention as being broad enough to cover the production of a froth by the use of oil. It did not regard the quantity of oil used as of the essence of the invention. It therefore sustained not only the fraction-of-one-per-cent. claims, but it *also sustained the small-quantity claims.*

The case then came before this court on appeal, and this court took an entirely different view of the subject-matter.

This court found that the essence of the invention was in the relatively microscopic quantity of oil used.

I will ask your Honors to read with me a few extracts from your decision in that case. We have here all the opinions bound together for convenience, and if your Honors will turn to page 22 of this pamphlet, the middle of the first paragraph, you will find this court said :

“That which is presented as new in the patent, and as the *pivotal discovery* on which its validity depends, is the formation of a froth or scum containing the metalliferous matter produced by agitation of the pulverized ore in water, by the action of oil in a quantity *less than one per cent.* of the quantity of ore treated.”

Now, if you will turn to page 26, beginning with the paragraph near the middle of the page—this court said :

“When the claims and the description of the process of the appellees’ patent are compared with the patents of the prior art” [your Honors had just before that taken up the prior art patents and discussed them one by one, and you continue as follows]: “it will be seen that the *only material difference* is in the *smaller* quantity of oil which the appellees use.”

Now, if you will turn to page 35, the third line of that first paragraph—you said :

“What they claim to be the new and useful feature of their invention, as stated by their counsel, is ‘agitating the mixture to cause the oily coated mineral to form a froth.’ As we have seen, that feature was *clearly anticipated* by the prior art, and when the elements of the appellees’ claims are read one by one, it will be found that *each step in their process* is fully described in more than one of the patents of the prior art, with the *single exception of the reduced quantity of oil which they used.*”

I may say that your Honors in that opinion pointed out that it was old in the art to use quantities of oil as little as *one per cent.*, but it was new to use oil in these extremely small quantities which are described in this patent. Your Honors

held as a *matter of law* that that difference did not constitute patentable subject-matter.

The patent next went before the District Court of Delaware, Judge BRADFORD. Judge BRADFORD reviewed the prior art and agreed with this court in finding that the essence of the invention—the new thing—was the use of these extremely small quantities of oil—these microscopic quantities. He said, in his opinion at page 88 :

“ The patentability of the process of the first patent in suit resides in the use of oil in the *extremely minute proportion* disclosed in the descriptive portion of the patent to effect separation of froth with its metallic particles from the remainder of the mixture by flotation. The amount there disclosed is not in excess of ‘ *a fraction of one percent. on the ore* ’, and may be only one-tenth of one percent on the ore, or even less.”

Judge BRADFORD viewed the patented process as your Honors viewed it—that is to say, he found that the essence of the invention was in the use of these extremely minute quantities of oil. Therefore, while he sustained the fraction-of-one-per-cent. claims, *he condemned as too broad, and therefore invalid, the small-quantity claims*. In other words, he held that these patentees were not entitled to claim the use of a *small quantity* of oil, because that was old. All they were entitled to claim, he held, was the use of this extremely small fraction of one per cent. of oil.

The patent next came before the Supreme Court in the Hyde case ; and that court agreed with this court, and with the District Court of Delaware, in finding that the essence of the invention was in the use of this extremely small fraction of one per cent. ; and, the Supreme Court, therefore, just as Judge BRADFORD had done, while sustaining the fraction-of-one-per-cent. claims, *condemned and held invalid the small-quantity claims*—held them invalid because they were too broad. Let me read very briefly from the decision of the Supreme Court, at page 109 of this pamphlet, beginning at the second paragraph :

“ The prior processes which we have described required the use of so much oil that they were too expensive to be used on lean ores, to which they were

intended to have their chief application, and the efforts of investigators for several years prior to the discovery of the process in suit had been directed to the search for a means or method of *reducing* the amount of oil used, and it is clear from the record that approach was being made, slowly, but more and more nearly to the result which was reached by the patentees of the process in suit in March, 1905."

Turning now to page 115, beginning two lines from the bottom of that page :

"While we thus find in favor of the validity of the patent, *we cannot agree with the District Court in regarding it valid as to all of the claims in suit*"—

Your Honors remember that the District Court had found these small-quantity claims valid, and the Supreme Court said :

"While we thus find in favor of the validity of the patent, *we cannot agree with the District Court in regarding it valid as to all of the claims in suit.* As we have pointed out in this opinion, there were many investigators at work in this field to which the process in suit relates when the patentees came into it, and it was while engaged in study of prior kindred processes that their discovery was made. While the evidence in the case makes it clear that they discovered the final step which converted experiment into solution, turned failure into success, yet the investigations preceding were so informing that this final step was not a long one, and the patent *must be confined to the result obtained by the use of oil within the proportions often described in the testimony and in the claims of the patent as 'critical proportions' 'amounting to a fraction of one per cent. on the ore,'* and therefore the decree of this court will be that the patent is valid as to claims Nos. 1, 2, 3, 5, 6, 7 and 12" [that is the fraction-of-one-per-cent. claims] "and that the defendant infringed these claims, but that it is *invalid as to claims 9, 10 and 11.*" [Those are the small-quantity claims.]

So the only disagreement between this court and the Supreme Court—literally the only thing concerning which there was any disagreement—was concerning the *question of law* as to whether the reduction of the oil used to a small

fraction of one per cent. constituted patentable subject matter. Your Honors held it did not; the Supreme Court differed from you only in respect to that holding. The Supreme Court agreed with your Honors as to your *finding of fact* as to the state of the art, as to where the invention, if it were an invention, resided.

Subsequently the patent went before the Court of Appeals for the Third Circuit in the Miami case, and that the court found, just as all the courts except the District Court of Montana had found, that the invention resides in the use of this extremely small, critical amount of oil. That court said, at page 134 of the pamphlet, beginning at the bottom of the page:

“ The affinity of oil for metal was known, and though old, was employed in the invention; but that this affinity in a given condition is greatest when its quantity is relatively least or that the affinity increases with the decrease of oil below a given quantity (less than one per cent.) is the *soul of the discovery*, and was wholly new.”

Finally the patent has again come before the learned District Judge of Montana, and he has held that the defendant, in the use of oil in quantities of *more than one per cent.*, infringes the valid claims of the patent in suit. To our mind, the decision of the learned judge amounts to a reaffirmance of his original opinion, *including those errors in it which the Supreme Court had condemned*. Let me read briefly from the opinion below, beginning at page 210—beginning at the bottom of that page, last paragraph:

“ Ambiguity and obscurity were as much due to the extreme mechanical simplicity of the process as to the inability then and now to know and explain all its laws or principles. The tendency was to attach *prime importance* to reduction in amount of oil used, when in fact this is but a *necessary incident* (for which there are *substitutes* if not *equivalents*) to the creation of the infinitude of bubbles that do the work.”

He still thinks the quantity of oil is quite immaterial.

If you will turn to page 213: The Supreme Court, as I pointed out, limited the invention to the “critical propor-

tions," and said that was the whole novelty in the subject-matter. This is what the court below said concerning "critical proportions:"

"These 'critical proportions' are like those *known to and solved by every child with its pipe and bowl of suds*. Too little soap, the bubbles are few, small, fragile, and break quickly. Too much soap, they flow from the pipe in a torrent, are heavy, and refuse to float. The right amount of soap, 'the critical proportions,' his bubbles are large, detach readily and float high, far and for long. *So is it with the bubbles in this process.*"

The court below evidently did not find the invention in the "critical proportions," as I submit the Supreme Court did.

If you will turn to page 219, beginning just before the end of the first paragraph:

"It seems clear neither patent nor decision undertakes to say the process *depends upon* less than one percent of oil, or is inoperative with one percent or more of oil. It is true that in the beginning and *during the Hyde suit* the patentees inclined to so believe or at least believed better results would be obtained by a fraction of one per cent. of oil. Perhaps limited investigations and experience with few ores and oils justified the belief. Indeed, all experience to date, plaintiff's, defendant's, stranger's, demonstrates that with any ore and any efficient oil, less than one percent of oil gives better results, all circumstances considered. The 'critical proportions' referred to seem absent, in terms, from the patent, and ought not to be adversely inferred in disregard of construction in favor of the patentee where the patent is ambiguous. The patent describes oil 'considerably reduced' and refers to a 'fraction of one percent' by way of example. And though some claims limit oil to such fraction, and a limited range within it, others are for 'a small quantity' and for that reason were held invalid by the Supreme Court. *With the later knowledge of this suit it is doubted that such would be the decision now.*"

In other words, the learned judge still thinks he was right in his decision in the Hyde case in sustaining those small-quantity claims and thinks the Supreme Court was wrong in

finding them invalid! But as I said in the beginning, the decision of the Supreme Court as to the construction of this patent is the law of the land.

Now, I shall turn to the patent itself. The claims which were sustained by the Supreme Court are limited to "a" fraction of one per cent. The question arises, to *what* fraction of one per cent. are they limited? We say that they are limited by the decision of the Supreme Court to *that* fraction of one per cent. which is *one-half of one per cent. or less.*

The Supreme Court, in its decision, as you have already heard read, says this:

"The patent must be confined to the results obtained by the use of oil within the *proportions often described in the testimony and in the claims of the patent as 'critical proportions'*".

So, the question arises, What are the "critical proportions" described in the specifications? The "critical" proportions described in the specifications are between one-fiftieth of one per cent. and one-half of one per cent.; that is, one-half of one per cent. or less. If your Honors will turn to page 1, line 79, of the specification, you will find this:

"To this is added a very small proportion of oleic acid (say from 0.02 per cent. to 0.5 per cent. on the weight of ore)."

That is, from one-fiftieth of one per cent. to one-half of one per cent.

And further down in the same column, line 96, the following appears:

"The minimum amount of oleic acid which can be used to effect the flotation of the mineral in the form of froth may be under 0.1 per cent. of the ore, but this proportion has been found suitable and economical".

In other words, in the patent the "critical" proportions are given as one-half of one per cent. or less. The preferred proportion is one-tenth of one per cent.

Now, the Supreme Court said that the claims must be limited to the "critical" proportions which were "often re-

ferred to in the testimony of the witnesses ; ” so I shall ask your Honors to go to the testimony of the witnesses in the Hyde case to ascertain what were the “ critical ” proportions which are described by those witnesses. Of course we have not the time to do it now. I have in our brief collated a number of extracts from the testimony of plaintiffs’ witnesses in the Hyde case—and the Hyde case, by the way, is part of the record in this case ; it has been stipulated in this case as a part of the record before your Honors. You will find that the “ critical ” proportions described by these witnesses were in the neighborhood of one-tenth of one per cent. They all said the largest amount of oil that had ever been used with any ore was two-tenths of one per cent.

So by referring to the testimony of the witnesses and the specifications of the patent the Supreme Court, I submit, limited the valid claims to that fraction of one per cent. which is *one-half of one per cent. or less.*

JUDGE MORROW : Does the term “ critical proportions ” refer to a proportion that is less than one-half of one per cent., or does it refer to some proportion beneath one-half of one per cent.—a definite proportion below that ?

MR. BULL : The statements of the plaintiffs and their counsel, which I will read in a few minutes, I think will answer that question. What they said was there is a “ critical ” quantity ; that the “ critical ” quantity is usually one-tenth of one per cent. ; sometimes it gets as high as two-tenths of one per cent.

JUDGE MORROW : Varying with the ore ?

MR. BULL : Varying with the ore. Sometimes it goes as low as one-half of one-tenth of one per cent. ; but they said it never goes beyond those limits, and that those proportions were “ critical ” ?

JUDGE MORROW : That is definite.

MR. BULL : That is definite for each ore.

JUDGE MORROW : For each ore ?

MR. BULL : For each ore.

JUDGE MORROW : That is to say, that proportion that will work for a particular ore ?

MR. BULL : That is right.

Such a construction, limiting the claims to one-half of one per cent. or less, was not only compelled by the record, but it

was invited by plaintiff's counsel in their brief and oral argument before the Supreme Court. Their brief before the Supreme Court, on the very first page, in the opening statement, reads as follows (I read from page 33 of our brief):

"The distinctive feature of the invention patented is the employment of air bubbles in co-action with a *minute and critical* amount of oil in a mixture of ground ore and water, so as to produce upon the surface of the water a froth containing substantially all of the metallic particles which can be easily flowed off or removed.

"This process was never used before. This result was never obtained before. The process is dependent upon the use of oil in a *minute and critical* amount and thorough aeration. If more oil is used, *you do not operate the process*, and you do not get the result. So, also, if less oil is used, the *process is not operated* and the result is not obtained. By using other and greater quantities of oil you operate a *different* process, and you obtain wholly different results. That the *critical* amount of oil characterizing the process is a *minute* amount of oil (varying slightly with different ores and different oils) is merely a fortuitous circumstance. Nevertheless, the process is dependent upon such *definite minute* amount of oil."

They made the same statement in their oral arguments. You will find quotations from their oral arguments in our brief. In answering questions which were propounded by the court—I will ask your Honors to turn to page 17 of our brief, and you will see reported there a colloquy between Mr. Justice McREYNOLDS and Mr. Kenyon :

"MR. JUSTICE McREYNOLDS: I would like to ask you when in this process of reducing oil your invention came into existence ?

"MR. KENYON: *At about one-half of one per cent. of oil.*

"MR. JUSTICE McREYNOLDS: Before you got to the one-half of one per cent., did you have any invention ?

"MR. KENYON: We were passing from the region of Cattermole, which was a distinct—

"MR. JUSTICE McREYNOLDS: I want to know when your invention came into existence ?

"MR. KENYON: This invention was not reached, I

should say, from those figures, *until about .5—that is, one-half of one per cent. of oil—was reached.*

“MR. JUSTICE McREYNOLDS : At one per cent. you had no invention ?

“MR. KENYON : No.

“MR. JUSTICE McREYNOLDS : At one-half of one per cent. you did have invention ?

“MR. KENYON : It began to come. Remote, but it began to come. At .3 of one per cent. the float vastly increased. At .1 of one per cent. the float again vastly increased.

“MR. JUSTICE McREYNOLDS : *When this float has more than one-half of one per cent. of oil it does not infringe ?*

“MR. KENYON : *It does not infringe.*”

So I say the Supreme Court in limiting these claims to the “critical proportions” often described in the testimony of the witnesses in the Hyde case and in the specifications, limited them to that fraction of one per cent., which is *one-half of one per cent. or less.*

On what theory did the court below find infringement in the use by the defendant of more than one per cent. of oil ? The theory is this : Since a larger quantity must always necessarily include a smaller amount, when the defendant uses more than one per cent. of oil, it necessarily uses a small fraction of one per cent. ; and since a small fraction of one per cent. will do the work as well as, or better than more than one per cent., all above the small fraction is useless, wasted or detrimental, and therefore should not be counted as oil in the process. That is the theory on which the learned court below found infringement in the use by the defendant of more than one per cent. of oil.

Now, I submit, may it please your Honors, that reasoning might be perfectly sound if this were a case in which the facts were that these patentees were the first to give the art oil, water and agitation. But, as a matter of fact, these patentees were not the first to do that ; they were not even the first to give the art oil down to one per cent., as your Honors found in the Hyde case, and as every other court following has found. All these patentees gave the art was a small fraction of one per cent. of oil, as distinguished from one per cent. or more. Their contribution, therefore, was only the *avoidance of the*

use of larger quantities of oil. The reasoning of the lower court entirely neutralizes and wipes out the ground on which the Supreme Court held invalid the small-quantity claims. The Supreme Court said the small-quantity claims were too broad. It said to the plaintiffs: "You are not entitled to a monopoly on the use of a small quantity of oil; that was old; all you are entitled to is a monopoly on the use of the 'critical proportions' which you have described and which are less than one-half of one per cent. That is what you contributed to the art; it is all you contributed to the art; and that is all you are entitled to."

The decision below, may it please the court, in view of the fact that defendant here is using the prior-art quantities of oil (because it was old to use as little as one per cent. of oil), amounts to saying that by the issuance of the patent in suit the public has been deprived of the right to do what it was in the habit of doing before these patentees entered the field; and that, may it please your Honors, is a *reductio ad absurdum*.

So I say, the decision below, as it seems to us, totally neglects the theory on which the Supreme Court condemned these small-quantity claims. The Supreme Court found that the invention here was in the *avoidance* of the use of a "small quantity" and in the *adoption* of a small fraction of one per cent. And by condemning the small-quantity claims, the Supreme Court has said, as plainly as any court could say it, that the public is at liberty to use a *small quantity* of oil provided it does not use some fraction of one per cent. which is less than one-half of one per cent.

The defendant in this case, may it please the court, does not use more than one per cent. of oil because it cannot use less and get satisfactory results, or get even better results than it is getting now. It uses more than one per cent. of oil because the Supreme Court has said that it is not at liberty to use less than one-half of one per cent.; and like every burned child it dreads the fire and therefore is using more than one per cent. of oil.

Plaintiffs' counsel in this case have figured out from the testimony that the use by the defendant of more than one per cent. of oil has cost it, in increased cost and diminished recoveries, more than a million dollars a year. It is costing defendant more than a million dollars a year to avoid in-

fringement of this patent, as it has been construed by the Supreme Court, according to the figures of plaintiffs' counsel. What the Supreme Court gave the plaintiffs is the exclusive right to save that million dollars a year in a plant such as the defendant's. Defendant is not saving that; it is not using the plaintiffs' process; it is not, we submit, infringing the patent in suit.

The defendant's oil consists of a mixture of oils. It is a mixture composed of one-fourth vegetable oil (that is, pine oil) and three-quarters mineral oil (that is, a fuel oil, and sometimes a small percentage of kerosene). My learned friends argued below that the mineral oil of this mixture was inert and useless; that it is added to the mixture as a diluent, merely to increase the volume. They referred to it being as useless in the process as milk or sawdust. Therefore they said they should take account of the mineral oil of the mixture in determining the amount of oil we used. Apparently my friends have abandoned that contention in this court, if I understand their brief. They admit now that mineral oil is not inert and useless in this process. They were compelled to admit this, because it appears by the evidence that all of plaintiff's large licensees in this country—all of whom are entitled to use as little oil as they can use, and of course every one uses as little as he can use, because the expense, even of this small quantity, runs up into very large figures in the large mills—practically all of plaintiffs' large licensees, who are at liberty to use as little oil as they can use, use a mixture of oil, composed of vegetable oil *and mineral oil*, just like that used by defendant. Practically all of plaintiff's licensees use a mixture of oils of which a *mineral* oil is one of the components. So it is perfectly obvious by their own practice that a mineral oil is not inert and useless. That is true of the standard mill practice of the Braden Copper Company, licensees; the Anaconda Copper Company, licensees; and the California-Arizona Company, also licensees. Some of them, indeed, use the identical proportion of vegetable and mineral oils which we use—that is to say, one-quarter vegetable oil and three-quarters mineral oil.

Furthermore, it is established by the proofs in this case that practically all the infringers—those who were before the

Supreme Court decision using the process without the license of the plaintiffs—that practically all of the infringers in this country used as oil a mixture of oils, composed of vegetable oil and mineral oil, just as we now use. I am referring now to the practice of the infringers before the Supreme Court decision was handed down, and when they used the smallest quantity of oil they could use. This was true of the Utah Copper Company, both at its Magna plant and its Arthur plant; it was true of the Chino Copper Company; and it was true of the Ray Consolidated Company, and others. In fact, plaintiffs' expert Greininger admits that at a plant in British Columbia, he installed and used as a steady thing a mixture of 25 per cent. vegetable oil and 75 per cent. mineral oil, which is precisely the mixture which we use. That will be found in volume 7, page 4060, x-Qs. 120 to 123. I have noted this reference to the record, because it is not in my brief, and so that it may appear in the report of my argument.

So it is perfectly evident that the mineral oil constituent of our mixture is not inert and useless. The mixture that we use is one which is commonly used and almost universally used in this country by those who are using one-tenth of one per cent. of oil, and by those who are operating under licenses from the plaintiffs.

I should further refer to the fact that plaintiffs' own witnesses, Higgins and Chapman, admit that so far from being inert and useless, mineral oil is highly useful in a mixture when employed in flotation processes. I read from page 47 of my brief. Plaintiffs' witness Higgins, by the way, is the man who made the original experiments, and knows as much about this subject as anybody in the world, I presume, and he says this concerning the use of petroleums :

“ They are *useful* in the process of the patent in suit chiefly for the purpose of preventing the coarse mineral from falling out of the froth.”

That is to say, holding the mineral in the froth. Then, further on he says : that it

“ prevents showering, that is, it helps to keep the mineral from falling out of the froth.” ”

Furthermore, plaintiffs' witness Chapman says, concerning petroleum :

" I have on *many* occasions used inactive oils, particularly those like fuel oil, kerosene and stove oil, to produce a *condition of froth* in the spitz box that will maintain a steady condition of overflow. The addition of these re-agents in small quantities is *extremely useful* for the purpose, and considerably eases up the operating work."

Therefore, may it please your Honors, it is plain that the use of the mineral oil constituent of our mixture is not the use of a diluent simply to increase bulk, but that it is used for beneficial purposes in the process.

In this court the complainants have advanced a new theory. The theory they advance now is this : they say mineral oil is not a *froth-producing* oil. They say that the oil of the claims is only that oil which will produce a *froth*, and therefore the mineral oil should be excluded in the computation of the amount of oil which we use.

Now, may it please your Honors, there is absolutely no foundation, either in fact or in the patent, for such a theory as that. The fact is, the patent directly contradicts the theory. If your Honors will turn to the claims of the patent again—claim 1—you will see that it designates very particularly and clearly what is the oil of the claim. It says it is an "oily liquid having a *preferential affinity for metalliferous matter*." The oil of that claim is such an oil as has a "*preferential affinity for metalliferous matter*." So the question immediately arises, Do mineral oils have a "preferential affinity for metalliferous matter?" And it is admitted, may it please your Honors, that they do. My learned adversaries admit that mineral oil, as well as vegetable oil, has a "preferential affinity for metalliferous matter." As a matter of fact, it has a greater affinity for metalliferous matter than has vegetable oil, and that is the reason why we use it in our mixture.

The claims do not say "an oily liquids producing a froth." They say "an oily liquid having a preferential affinity for metalliferous matter." And whenever you have such an oil or oily mixture, containing something which will produce a froth,

you have the "oily liquid" of the claim. So I say there is absolutely no basis for the plaintiffs' contention that the oil of the claim excludes mineral oil, since that oil has this "preferential affinity for metalliferous matter."

But is it a fact, as they allege, that mineral oils do not have any froth-producing qualities? I submit it is not, and I shall ask leave to hand up a memorandum of references to the record on this point which I shall refer to in this part of the argument, because they are not in our brief.

In the first place, I wish to call your Honor's attention to the fact that the patentees of this patent in suit, in the very first written description of the invention describe a mineral oil as a substitute for oleic acid, the specific oil which is mentioned in the patent. If your Honors will turn to page 47 of my brief, you will find the report of the patentees to the chairman of Minerals Separation of the discovery of the invention at bar. This is the first written description of the invention. They say:

"We may here conveniently note that *other oils* beside oleic acid may be employed in this modified recovery process, but so far as Broken Hill is concerned, oleic acid gives by far the best results." ["Broken Hill" was the ore with which they were experimenting at that time.] "*Petroleum residuum* added as emulsion, *paraffine oil alone* ["paraffine oil" is the English name for kerosene] "*paraffine oil alone*, R_3P_1 and R_1P_3 emulsions, have also been used, and *all give small proportions of float*, but do not act nearly so vigorously or efficiently on *Broken Hill ores* as plain oleic acid."

So in their very first description of the process they describe the use of a mineral oil (that is, kerosene), as the equivalent of oleic acid and capable of producing a mineralized froth, but say it does not give as good results on Broken Hill ores.

In the British patent which corresponds with the patent in suit, the complete specifications describe in the working example of the patent the use of *petrol*, which is gasolene, page 1279, line 38. They say, speaking of the pulp:

"To this is added a very small proportion of oleic acid or petrol or other suitable oil".

There again, you observe, they give a mineral oil as the equivalent of oleic acid, which is the specific oil mentioned in the patent here in suit.

JUDGE HUNT : What is oleic acid ?

MR. BULL : Oleic acid is what is commonly known in commerce as red oil ; it is a by-product in the manufacture of candles.

JUDGE MORROW : It is an animal oil ?

MR. BULL : It is an animal oil.

JUDGE MORROW : Not mineral or vegetable oil ?

MR. BULL : No.

That reference to " petrol " is repeated six times in those specifications. Your Honors understand that this is the British patent which corresponds to the patent here in suit.

JUDGE MORROW : Petrol is not mentioned in this patent.

MR. BULL : No, it is not mentioned in the patent in suit, but we are only now considering the question of fact as to whether mineral oil is capable of producing a mineralized froth—mineral oils alone. The fact is, the application for the patent here in suit was filed within a month after the provisional specifications were filed in Great Britain. The provisional specifications contained exactly the same language as the specifications in the patent in suit. The complete British specifications were filed some months later, and by that time the patentees had verified the fact that mineral oils would act as well as oleic acid and they put " petrol " in, in addition to oleic acid, in the specific example.

Your Honors observe that the patent in suit opens with a reference to the prior Cattermole patent. What it says is as follows :

" In the process described in the previous United States patent, No. 777,273, granted to A. E. Cattermole, an amount of oil varying from 4 per cent. to 6 per cent. of the weight of metalliferous matter present is agitated with an ore pulp ", etc. " We have found that if the proportion of oily substance be considerably reduced—say to a fraction of one per cent. on the ore "—etc.

In other words, this patent in suit opens by saying that the use of the *oily substances of the Cattermole patent*, if reduced in quantity, will produce the desired result. That carries us directly to the Cattermole patent to ascertain what are the " oily substances " mentioned in that patent. The Cattermole

patent is found in Volume 4, page 2138. At line 91, describing the oils which may be used, the patent says:

“The ‘oil’ used may be animal, vegetable or *mineral* oil” [the three kingdoms of oil] “or *mixtures* of *these* or such coal or wood tar products or other substances which exercise, like oils, a preferential physical affinity for metallic mineral matter as distinguished from gangue.”

So the Cattermole patent, to which reference is directly made in the patent in suit, and to which the reader is referred to ascertain what character of oils may be used—that patent tells you that *mineral* oils, and *mixtures* of vegetable and mineral oils, are included among the class of oils which may be used for this purpose.

Plaintiff’s witness, Mr. Higgins, to whom I have already referred as the gentleman who made the original experiments which resulted in the discovery of this process, said:

JUDGE MORROW: Mr. Bull, is there a difference in the affinity of oils for the metalliferous content or the pulp?

MR. BULL: Yes, your Honor.

JUDGE MORROW: I mean as between vegetable and animal or mineral.

MR. BULL: They differ between themselves; that is to say, some mineral oils have a greater affinity and some have less affinity for metalliferous matter; they have different affinities for different metalliferous matters. So, also, they have more or less frothing properties. It is the same with vegetable oils. It is the same with animal oils. There are no sharp lines. There is a gradual gradation. You will find that a certain oil has a greater preferential affinity than some other oils; that another has a greater froth-making capacity. That is the reason why it appears all through these records and through all of the tests, that they have to “cut-and-try” in this process; that is to say, you cannot, because one mixture of oils will work well at one place, conclude it will work equally well at some other place. As these patentees said in their first description of invention: with Broken Hill ores mineral oil does not work as well as oelic acid, but still it *forms a froth*; and they intimate that it may work as well as oleic acid with other ores.

Plaintiff’s witness, Higgins, in Volume 4, page 1811, said,

when asked what other oils he used besides oleic acid, with the result of producing froth :

" Q. 110. What other oils? A. I have obtained satisfactory results by the use of *petrol*" [gasolene] " certain portions of the distillate of *crude petroleum*, such as *cosmos* oil" [which is another petroleum] " vegetable oils, such as palm oil, cottonseed oil, linseed oil, and animal oils, such as lard oil, and oil squeezed from beef fat." [All kinds of oils; the three kingdoms of oils: animal, vegetable and mineral.]

" Q. 111. Have you been successful in the use of eucalyptus oil? A. Yes.

" Q. 112. Is the petrol to which you refer the distillation product of petroleum, sometimes known as 'gasolene'? A. The petrol I refer to is one of the lightest constituents of crude petroleum. I do not know whether gasolene is the same material.

" Q. 113. The petrol you refer to is the distillation product commonly used in internal combustion engines, such as automobile engines, is it not? A. Yes. It is known as .680 spirit.

" Q. 114. Is the 'paraffine' referred to in Higgins' report, March 16, 1905, the same as lighting oil or kerosene? A. Yes.

" Q. 117. Can you state what the smallest quantity is of eucalyptus oil that will produce a froth, operating upon, say, some one of the Broken Hill ores with which you have experimented? A. The smallest quantity of eucalyptus which I have found in my experiments with Broken Hill ore to give a satisfactory concentration as a froth, is half a pound to the ton of ore.

" Q. 118. Would you obtain equally good results on that same ore using one-half pound of *Cosmos* oil?"— [That is, mineral oil.] " A. Speaking from memory, I believe the results on *Cosmos* oil may have been a little lower when such a quantity of oil was used.

" Q. 119. Will *Cosmos* oil in any quantity give as good a recovery as eucalyptus oil? A. *Yes, I think so.*

" Q. 120. You would have to use more of the *Cosmos* oil than eucalyptus oil? A. *I am not certain that I should do so.* I have not made comparative experiments with these two oils, and it is possible that the same results might be obtained in *different periods of time for the agitation*" [That is, agitation, longer or shorter].

" Q. 121. What is *Cosmos* oil; that is, what is its origin and what is it used for? A. It is *petroleum distillate*, sold for lubricating purposes.

" Q. 122. Is it what is sometimes called cylinder oil?

"A. I do not know. I think it is more in the nature of a valve oil.

"Q. 123. Is the Cosmos oil the Standard Oil Company's Cosmos oil?

"A. Yes, the samples were obtained from their London firm, the Anglo-American Oil Company."

So plaintiffs' own witnesses admit that mineral oil alone will produce a froth and is useful in that process.

JUDGE MORROW: The production of froth, and the affinity for metalliferous contents of the ore differ?

MR. BULL: Yes.

JUDGE MORROW: They are not the same?

MR. BULL: There are oils that will produce a froth that have no affinity whatsoever, and of course cannot be used. What you need is both. You must have frothing, and you must have affinity.

JUDGE MORROW: If oil produces froth, and has an affinity for metal, that is the best oil?

MR. BULL: Yes; or a mixture of oils which contain those two qualities, because they almost all use mixtures. A mixture that contains those two qualities properly balanced is the best oil for that particular ore.

Dr. Sadtler, defendant's witness, also testified concerning kerosene. I shall not stop to read what he said, because I see my time is getting very short. You will find it quoted in my memorandum, which I have handed up. He states that some kerosenes won't raise a froth. In his experience, three out of four kerosenes will produce froth, and one kerosene out of four will not produce froth.

Defendant's witness Janney made a series of full mill tests, of 24 hours each, using as oil a mixture such as the defendant uses—that is, one-quarter vegetable and three-quarters mineral oil—or a proportion somewhat like that—and obtained certain results. Then he used alone the vegetable-oil constituent of that mixture and obtained certain results. Then he used alone the mineral-oil constituent of that mixture and obtained certain results. The results of these tests shows that the mineral-oil constituent of the mixture used alone gave as high recoveries as did the vegetable-oil constituent of the mixture used alone, but when the two oils were used together, as we use them, he obtained higher recoveries than by the use of either of the separate constituents of the mixture.

Defendant's witness Wicks describes what happened in his plant employing a mixture of vegetable and mineral oils like that employed by the defendant, where by some fault of the machinery the supply of mineral oil was shut off. He said the froth immediately disappeared, and he searched around to find the cause. That was the first knowledge he had of the fact that something had gone wrong. He found all that had gone wrong was that the supply of mineral oil had been shut off.

Defendant's witness Punchon described similar occurrences at another mill.

So we say there is no justification for the present contention of the plaintiffs that mineral oils have no frothing capacity. What we use is a mixture in which we obtain the desired percentage of frothing quality combined with the highest possible affinity for metalliferous matter.*

* After the argument certain experiments were made in Court by plaintiffs in *bar-mixers* for the purpose of proving that the mineral-oil constituent of defendant's mixture when used alone will not produce a froth with defendant's ore. These were criticised by us because the volume treated in a bar-mixer is so small and the depth of liquid so insignificant that the foaming qualities of the contents is very largely masked and affords no fair indication of what happens in commercial machines.

In the first bar-mixer experiment (called No. 6) 0.1% of kerosene alone was added to defendant's ore. After agitation the Court observed that an *excellent froth* was produced. There then was added to what was already in the bar-mixer, 0.1% of pine oil; and after agitation the Court observed that the *same froth* as before was produced, but its amount was somewhat increased. This experiment completely disproves plaintiffs' contention that kerosene alone will not produce a froth, and will not in a mixture contribute to the production of froth.

In the second bar-mixer experiment (called No. 7) there was added to defendant's ore a mixture of Jones' fuel oil and kerosene in the proportion in which these oils are used in defendant's mixture, and in an amount equivalent to that present in defendant's machines, so there was in the bar-mixer the entire mineral-oil constituent of defendant's mixture. After agitation the Court observed that an *excellent and voluminous froth* was produced. This experiment completely disproves plaintiffs' contention that the mineral-oil constituent of defendant's mixture does not produce a froth with defendant's ore, and completely establishes what we offered to show (but were not permitted to show) that in our commercial machine (the Janney machine) the mineral-oil constituent of defendant's mixture will produce voluminous froth with defendant's ore. Finally, there was added to what was already in the bar-mixer, 0.2% of pine-oil, which is the amount present in defendant's mixture, and after agitation the Court observed that the *same froth* as before was produced, but the amount was somewhat increased.

I shall devote my remaining few minutes to discussing the disclaimer which was filed after the decision of the Supreme Court was handed down.

We contend, may it please the court, that the plaintiffs have no right to maintain this suit because they have—to quote the language of the statute—“unreasonably neglected

In the third bar-mixer experiment (called No. 8) 25% of kerosene was added to defendant's ore, and after agitation the Court observed that an *excellent and voluminous froth* was produced. Subsequently, there was added to what was already in the bar-mixer 0.1% of pine-oil; and after agitation the Court observed that the *same froth* as before was produced, but its amount was somewhat increased. The froths produced in this experiment did not differ from the froths produced in the other experiments, except in that they were more oily in appearance—as they must necessarily be, owing to the fact that a larger proportion of oil was used. This experiment, therefore, disproves the contention of plaintiff's witnesses that a large percentage of kerosene will not produce a froth, and it verified the statements of defendant's witnesses that it will produce a froth.

I may say a word here concerning the experiments which defendant made at the same time: After agitating defendant's ore in a Gabbitt mixer with 0.2% of pine-tar oil, and producing a froth, defendant then added to what was already in the machine, enough of the same oil to bring the quantity up to 1.6% on the ore, and the Court observed that after agitation the *same froth* as before was produced, but in larger quantity. An analysis of this froth is in the record (Def't.'s Exh. 304, Test No. 36, Vol. IX., p. 5543), which shows that the zinc content was raised from 14.7% to 33.90%, and the gangue content (“Ins.”) was reduced from 67.0% to 31.20%. The test itself is described, Vol. I., p. 3353, Qs. 150 to 157. Defendant offered then to double the quantity of the same oil, making it 3.2% on the ore, but was not permitted to do so. This experiment proves that but for the very limited supply of vegetable oils obtainable and their relatively high cost, defendant could perfectly well use a straight oil in quantities above one per cent., instead of using a mixture composed largely of mineral oils, which are relatively cheap and the supply of which is unlimited. This experiment also casts a weird light on statements made by the plaintiffs to the Supreme Court which are quoted in our brief.

The second experiment performed by defendant consisted in agitating defendant's ore with defendant's oil mixture in a miniature of defendant's commercial machine (the Janney machine). The contents of the machine were, therefore, the same as those in the second stage of the second bar-mixer experiment above referred to. The amount of froth produced in the Janney machine was many times as great as that produced in the bar-mixer with the same ore and oil present, thus demonstrating our contention that bar-mixer experiments give no fair indications of the froth-producing capacity of an oil under commercial conditions, and explaining why we wished to repeat in the Janney machine the first stage of the second bar-mixer experiment.

or delayed " to file a suitable disclaimer as to those claims of the patent which were held invalid by the Supreme Court ; or, in other words, to those claims I have called the "small-quantity claims."

The patent, when it was before the Supreme Court, was good in part and bad in part. It was good in so far as the fraction-of-one-per-cent. claims were concerned, construed as the Supreme Court has construed them. It was bad in so far as the small-quantity claims were concerned.

At common law one could not maintain a suit at all on a patent which was good in part and bad in part. Such a patent was wholly bad. That is the way the law stood in this country until 1837. In the year 1837 Congress passed what are known as the disclaimer statutes, to mitigate the rigors of the common law. By those statutes Congress said that one whose patent is in the condition of plaintiffs' patent in this case, in which there are valid claims and invalid claims—good parts and bad parts—where the defect arises from the fact that the patentee claims too much—where the defect is an overclaim—the patentee may correct it by merely filing a paper in the patent office which is called a disclaimer, by which he relinquishes his claim to that part which he has claimed without right ; and that if he does not unreasonably neglect or delay to file such a disclaimer, he may maintain a suit—something he could not do before—on the patent while it is good in part and bad in part. The two disclaimer sections are 4917 and 4922. I think it is necessary only to read Section 4922, which will be found at page 72 of my brief.

"SEC. 4922. Whenever, through inadvertence, accident or mistake, and without any willful default, or intent to defraud or mislead the public, a patentee has, in his specification, claimed to be the original and first inventor or discoverer of any material or substantial part of the thing patented, of which he was not the original and first inventor or discoverer, every such patentee, his executors, administrators and assigns, whether of the whole or any sectional interest in the patent, may maintain a suit at law or in equity, for the infringement of any part thereof, which was *bona fide* his own, if it is a material and substantial part of the thing patented, and definitely distinguishable from the parts claimed without right, notwithstanding the specifications may

embrace more than that of which the patentee was the first inventor or discoverer. But in every such case in which a judgment or decree shall be rendered for the plaintiff, no costs shall be recovered unless the proper disclaimer has been entered at the Patent Office before the commencement of the suit. *But no patentee shall be entitled to the benefits of this section if he has unreasonably neglected or delayed to enter a disclaimer.*"

What are the benefits of that section ? The benefits of the section are that one may maintain a suit on a patent which is good in part and bad in part, something which could not be done at common-law. But he loses that right if he "unreasonably neglects or delays to file a disclaimer."

We say that the plaintiffs in this case have unreasonably neglected or delayed to file a disclaimer, and that they have thereby lost their rights to maintain a suit on this patent, which is still, we say, good in part and bad in part. Because, we say, the disclaimer which they filed is not a disclaimer in fact ; it is a disclaimer in form only, because it does not cancel the overclaim ; it is therefore a nullity ; and therefore no disclaimer in contemplation of law has been filed.

What the plaintiffs might legitimately have done after the Supreme Court declared the small-quantity claims invalid, was to file a disclaimer erasing those claims from the patent. They did not do that. They might, perhaps, have filed a disclaimer limiting them to a small fraction of one per cent., as the other claims were limited. They did not do that. What they did was to file a paper called a disclaimer, the essential part of which reads as follows—it is printed on the back of the patent :

" Your petitioner, therefore, for the purpose of complying with the requirements of the law in such case made and provided, and of disclaiming those parts of the thing patented which your petitioner does not choose to claim or hold by virtue of said Letters Patent No. 835,120, does hereby disclaim from claims 9, 10 and 11 of said Letters Patent No. 835,120, any process of concentrating powdered ores *excepting where the results obtained are the results obtained by the use of oil in a quantity amounting to a fraction of one per cent. on the ore.*"

What does that mean? They tell us in their brief what it means. At page 51 of the supplemental brief, they say :

“ Thus claim 9, since the entering of the disclaimer, is, in contemplation of law, only for the process of concentrating powdered ores, which consists in separating the mineral from the gangue by coating the mineral with oil in water containing a *small quantity* of oil” [you see “small quantity” is still in there] “agitating the mixture to form a froth, and separating the froth, *when the results obtained are those obtained by the use of oil in a quantity amounting to a fraction of one per cent. on the ore.*”

In other words, what their claim now means, in plain English, is this : “ We still claim the use of *more* than one per cent. of oil, where the results obtained are the same as if *less* than one per cent. of oil were used.”

Those claims are still as broad as they were when they were condemned by the Supreme Court, because claim 9 was from the beginning limited to the production of the froth of the patent in terms. Claim 9 differed from claim 1, as I show by parallel columns in my brief, only in respect of the fact that the former specifies a “fraction of one per cent.” and the latter specifies a “small quantity.” And these claims 9, 10 and 11 are still for a “small quantity” of oil. They still claim a “small quantity” of oil, when the results produced are the same as if a fraction of one per cent. were used.

Plaintiffs justify by saying that the language of the disclaimer conforms with the *words* of the Supreme Court decision ; BUT IT DOES NOT. What the Supreme Court said was that the patent must be confined to the “*results obtained by the use of oil within the critical proportions.*” What the disclaimer says is that the claims are confined to results *which are like those obtained by the use of oil within the critical proportions*—WHICH IS A VERY DIFFERENT THING.

UNITED STATES CIRCUIT COURT OF APPEALS FOR THE NINTH CIRCUIT.

BUTTE AND SUPERIOR MINING COMPANY,
DEFENDANT-APPELLANT,

v.

MINERALS SEPARATION, LIMITED ET AL.,
PLAINTIFFS-APPELLEES.

CLOSING ARGUMENT OF FREDERICK P. FISH FOR DEFENDANT-APPELLANT.

May it please the Court, it seems to us that the decision of the Supreme Court, which is, of course, controlling on most phases of this situation, is very clear, so clear that its meaning can not be clouded even by the great ingenuity of counsel. But it is fortunate that there is one thing in that decision as to which there can be no question whatever and that stands as a firm basis for the discussion between these contesting litigants, and that is this, that Claims 9, 10 and 11 of the patent in suit were declared invalid. The other claims in issue were sustained, but those claims were declared to be invalid. And why? It was not for any vagueness; it was not because of their form or for any artificial expression that the Court did not like. It was because these claims were not for the specific thing that the Court found to be new with these inventors, namely, the use in a process of this character of the "critical proportions" of oil, which those inventors, as the Supreme Court was persuaded, had discovered to lead to most remarkable results. That limitation was not in those claims; hence Claims 9, 10 and 11 were invalid. And yet those claims,

referring to the process aptly and in all other respects, differed from the claims that were sustained merely because of the use of the phrase "a small quantity" instead of the corresponding phrases of the other claims, which some in terms and all as the Court construed them were specific to the minute and critical proportion of oil shown by the testimony and asserted in the patent and in argument to be essential. Now, of course, that phrase "a small quantity" was apt for one-tenth of one per cent; it was apt for five-tenths of one per cent. There is no doubt about that. But they were also apt for somewhat larger quantities and the Court said that those claims were bad because the invention did not extend one iota beyond the specific "critical proportions" of oil, which "critical proportions" were not properly defined by "a small quantity", which might be argued to include a quantity not large, but beyond this critical amount. The patent was not valid for "a small quantity" if beyond this critical amount.

I shall come back to the patent later, but now ask your Honors to note the way in which the Supreme Court deals with the question as to what actually was this "critical proportion" of oil to which the patent is limited. It does not say that that somewhat vague phrase "a fraction of one per cent", which appears in some of the claims, was a sufficient indication of the scope of the patent. What fraction of one per cent is intended? It finds that "the critical proportions" of oil to which the patent is limited (so that Claims 9, 10 and 11 are invalid because not being restricted to those "critical proportions") are those "*often described in the testimony and in the claims of the patent* as 'critical proportions' amounting to a fraction of one per cent on the ore". It plainly indicates that the proportions "*often described in the testimony*" and the proportions which are referred in some of the claims as "amounting to a fraction of one per cent on the ore" are one and the same. It follows that the "fraction of one per cent" to which the patent is limited is not every fraction, however large, but only that particular range of small fractions of one

per cent “often described in the testimony” with perhaps the very large expansion of those fractions named as extreme limits in the specification and some of the sustained claims (from two one-hundredths of one per cent to five-tenths of one per cent).

What was the “testimony” to which the Court referred?

Your Honors will bear in mind all through the consideration of this case that the “critical proportion” of oil, in the process as practiced commercially, was absolutely fixed in the testimony in the case before the Supreme Court, as from one pound of oil to the ton of ore (which is five-hundredths of one per cent) to four pounds per ton (which is two-tenths of one per cent). All the plaintiffs’ witnesses, including the plaintiffs’ engineers and the inventors themselves, testified that those were the limits in practical operation. There was no dissent from Mr. Kenyon’s proposition to the Supreme Court that the invention was not present if one per cent of oil was used; that the invention only began to appear, when as little as five-tenths of one per cent was used; that it was first really present when three and two-tenths of one per cent was used and continued down to the use of two one-hundredths of one per cent. And the testimony was also clear to the effect that those were the limits in the case of all known oils. There was never in the Hyde record any thought of any discrimination between mineral, vegetable and animal oils, between petroleum oils and pine oil, for example, any more than there was any thought of such discrimination in the patent; for that patent is void, *ab initio*, if there is anything in the argument of Mr. Kenyon to which your Honors have listened, supported by Mr. Garrison, to the effect that petroleum products like fuel oil and kerosene are not oils of the patent, that certain oils only of those which have a “preferential affinity to metalliferous matter” are to be taken into account as useful in the patented process. Can a patent stand which says that, to practice the invention, you may use all oils that have a preferential affinity for metals as well as fatty acids and other substances, when

as a matter of fact, as the plaintiffs now contend, only *certain* of such oils can be used and you must hunt through the entire list of such oils, fatty acids and other substances to find which oils will do the trick, the patent itself giving no hint as to how you are to find such oils? Of course not. That would be no such disclosure as the patent law requires.

There was a similar situation in the case of the Incandescent Lamp Patent, 159 U.S. 465, where the patent was declared invalid because the claim was for a lamp filament of "fibrous or textile material", and the patentees did not tell how to find such materials or to recognize them when found. The patent, while specifically mentioning "paper", practically directed the reader to hunt through the universe and if he contrived to find fibrous or textile material that was useful for a filament, the patentee proposed to take away from him the right to use it. Here they do mention oleic acid, which the defendant does not use, as a mere illustration of an oily substance. But it is an illustration only. What the plaintiff now contends is, that many oils are not useful for a flotation process and that the fuel oil or kerosene which we use is not an oil of the patented process at all. I should judge from their talk that plaintiffs would contend that there are comparatively few oils which one can use in such a process. If that is so, the patent is fatally defective, for it does not give the information necessary to enable the public to know what oils to use and what not to use.

But the fact is that this is an after thought. The patent is clear. It says that one may use any "oil, fatty acid or other substance that has a preferential affinity for metalliferous matter"; and the plaintiffs must be held to that. When, therefore, we use fuel oil or kerosene, among other oils, we are using exactly what the patent tells us to use and our rights in this controversy are to be determined in view of the fact that we use *far beyond* the "critical proportions" of oil, not oleic acid, but other oils, whether pine oil, fuel oil, kerosene or anything else. There is no basis for the plaintiffs' argument that some

oils are more “frothing” than others and that the patent deals only with frothing oils. The patent and the Hyde record say nothing on this subject and the contention that a part of our oil is to be ignored because it does not happen to be what the plaintiffs call a “frothing oil” (although it does make a froth and is commonly used in frothing processes as the record and our brief abundantly show) is entirely unfounded.

In studying the record your Honors will be interested to find the innumerable combinations of oils and fatty acids that have been employed for the separation of minerals by flotation in different mining operations. The fact is that every ore must be studied and experiments made to determine what oil or combination of oils is best for use with that ore; and engineers differ in their views. Some engineers prefer a mineral, some a vegetable or other oil and other engineers prefer specific combinations of oils that appeal to them.

There is nothing in the proposition that fuel oils, kerosene and other mineral oils which have been so generally used in frothing processes as the record shows, are not among the precise oils which the patent says are to be employed in carrying out the alleged invention. In getting up his oil formula, every engineer selects his ingredients in view of the particular problem before him. It may well be that some oils make more of a froth than others. It is equally true that some oils have a greater preferential affinity for metals than others. Each engineer makes that combination of oils that will secure the frothing and utilize the preferential affinity to best advantage in dealing with the particular ore which is to be treated; and, of course, in each locality the question of the oil that can be obtained and its price in that locality are of the utmost importance and must be considered by the engineer in making his combination.

I will go back a little, if your Honors please. It is rather interesting to glance, even at this late stage of the litigation, at the state of the art. The patent, of course, recognizes that everybody has known — it has been conceded here by counsel

that everybody has known it for a great many years — this matter of the preferential affinity of oil, of all oils for that matter, for minerals. I will not waste time showing that to be true, because it is conceded. It had also been as definitely known, long prior to the invention of the patent in suit, that one could generate bubbles of gas or air in a pulp made up of ore, oil and water, and that the oil would coat the mineral particles and the bubbles attach themselves to the oil coated mineral particles and carry them to the surface of the pulp. That had been known for a great many years. Until the last very few years, however, this knowledge had not been utilized commercially to a very large extent, but it had been known.

These three patentees, Picard, Sulman and Ballot, were associated in a great engineering concern in London and had been working on this sort of a mineral separation problem for years, agitating ore, oil and water in a pulp. The way this invention happened to be made was that these three men, working on a method devised by Cattermole, told Mr. Higgins to try a lot of experiments, to work to the limit in finding out exact facts, among other things to study the action with such a pulp when less and less quantities of oil were used down to the “vanishing point”. He did what they told him to do and made what they now say was the remarkable discovery that when only a minute quantity of oil was used, from one pound to the ton of ore (.05 per cent) to four pounds to the ton (.2 per cent), according to the testimony, or from .02 to .5 per cent, according to the wide range stated in the patent, a marvelous new process had been discovered.

Now, Mr. Picard and Mr. Sulman had known for many years the other fundamental important thing, namely, the utility and efficiency of bubbles of air or other gas as an agency for lifting oiled metallic particles to the top of a pulp made up of ore, oil and water. Mr. Sulman says on page 1603, Vol. 4 of the record, in answer to questions of his counsel:—

“Q. 3. Will you please state when you first learned of

the use of oil or fatty matter as a means of separating part of the constituents of an ore by flotation?

A. I first learned of the use of oil to separate particles of mineral of an ore by flotation due to the buoyancy of oil in about June, 1894.

Q. 4. Will you state when you first learned of the use of oil or fatty matter in connection with the supplemental action of a gas as a means of floating parts of the constituents of an ore, the ore being suspended in water as a pulp? (That, may it please the Court, is a pretty good description of the fundamentals of this process.)

"A. I first learned of the concomitant use of a gas with an oily substance and as an essential concomitant to flotation about July, 1903."

The invention of the patent in suit was made in the Spring of 1905.

"In this answer I do not refer to the more or less accidental presence of some air bubbles in the Elmore oil buoyancy process",—that is there were bubbles also there—"but prior to this I had noticed the tendency of oiled mineral to float at a water surface or when brought into contact with bubbles of air during the prosecution of researches into the Cattermole process."

On the next page, 1604, the question was asked him:—

"Q. 6. I understand from your answer to question 4 that about July, 1903, you had learned of the intentional use of a gas with an oily substance to produce flotation. If I am correct in this will you describe the process so referred to?

"A. A pulp of the ore containing the mineral which it was desired to separate was mixed with a small quantity of oil insufficient to float the mineral by the buoyancy of the oil alone and mixed sufficiently to ensure the attachment of small quantities of oil to the mineral."

This is what he knew two years before the date of the invention of the patent in suit.

“A gas was then liberated in or generated in the pulp so prepared and it was found that such gas had a tendency to attach itself to the oiled particles. If air were used this was liberated by blowing a stream of bubbles through the mixture in several ways, and if a gas other than air were employed this was generated in the liquor by chemical reactions or by electrolysis.”

May it please the Court, such were the bases of this process which is patented in the patent in suit, and it shows that the Supreme Court was right when it followed this Court in saying that there had been so much done in the study of the relations and actions of air, gas, bubbles, water and oil, in the separation of minerals, that the step from the prior art to the invention of the patent in suit was “not a long one”, wherefore the patentee must be limited to the thing which they said so emphatically was the secret of the whole invention, that is, the use of only the critical amount of oil, at the outside not over five-tenths of one per cent of the weight of ore. In the record (Vol. IX, p. 5306), your Honors will find that Mr. Kenyon asserted to the Supreme Court that in the Hyde case the invention is not present when “as much as one per cent of oil” is used; that it is just foreshadowed when five-tenths of one per cent is used and is not really present until you get down to three-tenths of one per cent. He stated emphatically that there is no infringement if “more than one-half of one per cent of oil” is used.

Your Honors will therefore bear in mind that there was nothing new in the bringing together of ore, bubbles, oil and water for flotation purposes; that the “preferential affinity of oil for metalliferous matter” and the efficacy of bubbles to promote flotation, were well known. Everything was known except the value of using *only* the “critical” amount of oil and the unforeseen results which followed from that use. In the

Cattermole process with which these inventors had been experimenting for many years, it was the same old situation. Cattermole used oil and in "small quantity", but not in the "critical proportions" of the patent in suit. He and Sulman and Picard in practicing his method were not seeking to get flotation, although the record shows that they always had "froth", but by proper manipulation and by agitation, which they themselves show was sometimes just as great as the agitation under this patented process and which was performed by just the same apparatus, namely, the Gabbet mixer — they undertook to bring these elements, the oil, air, water and mineral, into such relations that the conjoint effect brought about by their manipulation of them would be the formation of grains of metalliferous matter; that is, the oil would smear the metalliferous particles and would coagulate the grains together, in which case they would be heavy and would drop so that they could be taken out at the bottom of the tank instead of at the top as is done with the patented Flotation Process. They finally introduced the Cattermole process into commercial use in Australia, but they hoped to improve it. Therefore they started in to experiment in a scientific fashion, utilizing their laboratory resources and their great experience with the view of determining all the conditions and all the relations of the elements with which they were working. They put up to Mr. Higgins seven lines of investigation, one of which was to try all quantities of oil down to the "vanishing point" as they say.

There is one thing I ought to say here in dealing with the Cattermole actions. There had been froth from start to finish in the Cattermole process. The witnesses repeatedly talk about that froth as appearing in their experiments and work.

Apparently, the great problem given to Mr. Higgins was to study and develop the influence of the various amounts of oil that might be used in this Cattermole granulation process which, as I have stated, always produced some froth. The results of his experiments are on page 1109 of Volume 3 of the record. He started with a normal amount of oil such as he

had used in his Cattermole experiments, say, three per cent of the weight of the ore, and then used less and less oil, varying his conditions somewhat. He always had froth, or "float", as he sometimes called it. He worked with oleic acid as his oily material, that being the type of oil which he had hit upon for his Cattermole work. When he used three per cent of oleic acid, there was very little float; but there was always some. When he had 1.5 per cent, there was rather more float. When he got down to .32 per cent of oil, then the "float vastly increased". When he went down to .10 per cent on ore, the float again "vastly increased". He had then realized the present invention, as Mr. Kenyon told the Supreme Court. That is about the limit of advantage. As a matter of fact, he went down to .002 of one per cent, but that is a "little worse".

At this point I would like to read from the report that goes with that Table and say a word or two about it. This Table shows the genesis of the invention which was a pure modification of the regular Cattermole practice. There is no indication that Higgins did anything new in this work except to vary the percentage of oil. In all other particulars, including agitation, he did exactly what he had always done during the whole period of the Cattermole experiments. He says, Volume 3, page 1108:—

"The effect of diminishing the percentage of oleic acid is to alter the type of oiling; the higher percentages producing granules and the lower ones froth. 6 per cent of oleic acid on the mineral"—which in this particular mineral would be 3 per cent on the ore—"is sufficient to form good granules"—How about froth?—"without much froth". The froth is there. "This froth consists of insufficiently oiled mineral mixed with large quantities of air." That air was undoubtedly in the form of bubbles because of the agitation with the Gabbett mixer. "As this percentage of oleic acid is decreased, the time for clean up of the sands is increased and more froth is formed. 0.62 per

cent oleic acid on the mineral is insufficient"—that is, .31 or .32 per cent on the ore—"to form any granules", that is, the point is reached where the quantity of oil is not enough to bring the oiled particles together in a bunch, where granulation stops. "Nearly the whole of the mineral comes to the surface, on stopping the cone, as froth."

We have then, in the series of experiments which resulted in the alleged invention of the patent in suit, "froth" or "float" developed at every stage whether three per cent or one-tenth per cent of oil was used. The plaintiffs contended in the Hyde case and now contend that the "froth" developed when the minute quantity of oil was used was an utterly different thing from other froths. Can anything be more absurd than such a proposition? Is it not certain that the froth was the same in character throughout the range, differing only as was inevitable because of the fact that different quantities of oil were used in the different experiments? And is it not clear that this Court in its former decision was right in holding that this froth which Higgins got, whether he used three per cent of oil or one-half of one per cent, was the froth of Froment, of Kirby and of Everson? I respectfully submit on this record that those froths were all essentially the same, differing from the others in each case only as a special quantity or kind of oil or the special degree of agitation employed in that case caused them to differ from the others. The underlying structure and character of the froth must necessarily always have been the same.

The Supreme Court expresses no difference with this Court on this point. Of course, in some instances there was more oil and in those cases there were all the incidental characteristics that arose from the presence of more oil; in some instances more agitation with the resulting difference due to the degree of agitation. Today our froth is like the froth of plaintiffs' patent or that produced by the plaintiffs' licensees when they use minute quantities of oil exactly (and in no other sense) as it is

like the froth of the prior art; but our froth is oilier than the patent calls for, oilier than is used by the plaintiffs' licensees and, being an oilier froth, undoubtedly has every single incidental difference which results from the use of more oil. Some of the froths of the prior art were still oilier and had characteristics based upon that fact. Fundamentally, however, all froths brought about by the agitation of ore, oil and water, with the inevitable development of air bubbles that accompanies that agitation, must be the same in character and in underlying organization. But for the purpose of this case it is the fact, so clearly and definitely settled by the decision of the Supreme Court that there can be no dispute about it, that over and beyond its fundamental character and properties, the froth produced when one-tenth of one per cent of oil is used differs from the froth produced when over five-tenths of one per cent of oil is used in essential particulars, due to the use of the critical proportion of oil, and necessarily incidental to that use, which the Supreme Court found to give character to the plaintiffs' invention, so that no one using more than five-tenths of one per cent of oil has what the Supreme Court found to be the contribution of the patentees to the art.

The froth produced by the Cattermole process, while generally speaking the same as that of the patent in suit in that it was brought about by the agitation of oil, air, ore and water was, as the Supreme Court has settled, different in that the special incidental qualities that followed from the use, in the patented process, of only the "critical proportion" of oil, a quantity not sufficient to granulate as Cattermole wished to do, involved results which the Supreme Court found to be of large importance.

So with the froths of the prior art,—Froment, Kirby, Everson and the rest—which were exhibited to this Court at the other hearing and to the Supreme Court. They were the same froths, generally speaking, but each had the characteristics inevitably imposed by the use of some particular propor-

tion of oil. The Supreme Court had those froths in mind in finding that the step taken by these patentees, namely, the use of the "critical proportion" of oil to which the patent is limited "was not a long one". Mr. Kenyon told the Supreme Court that he could not distinguish these froths of the prior art from the froth of the patent; but the Court accepted his further statement that the mill man knew the difference because when the critical proportion of oil was used great results followed.

Now, our froth is beyond question in the class of those prior art froths under the classification established by the Supreme Court, because since the decision in the Hyde case we have used, not the "critical proportions" of oil but over one-half of one per cent, in fact, generally of late years over one per cent of oil. If our froth as produced since early in 1917 had been exhibited before the Supreme Court, plaintiffs would have been forced to say that it was a froth of the prior art even if one could not so conclude merely from looking at it. The Supreme Court accepted their argument and determined in the clearest possible fashion that these patentees made a perfectly definite, specific, clean-cut discovery that when the proportion of oil used gets near to the "vanishing point", you get the maximum of that froth. That is the discovery; that is the thing they patented; that is what the Supreme Court has directed the courts of the land to secure to the plaintiff. The patent is not for "froth", but for a process, limited to the use of oil, in the defined "critical proportions".

Neither in the patent nor in that whole Hyde record, upon which the finding of the Supreme Court was based, will your Honors see one suggestion that in practising the invention we have to consider special oils or oily substances; that fuel oil or kerosene is less effective or pine oil more effective or anything of the sort. The patent and the Hyde record, raise no question, make no requirement as to the kind of oil that is to be used except that the oil must have a "preferential affinity for metal-liferous matter", which fuel oil and kerosene certainly have —

no one denies that. It does not necessarily follow that there are not some oils somewhere that are of such a peculiar character that they will work in the process better or worse than others, even if they have an affinity for minerals. But oils as a class have the required preferential affinity and therefore the use of any such oil is contemplated. And the patent sets forth that with every metal and with every new condition we have to experiment to find exactly how to apply the process. We must experiment and with oils as with everything else. Oleic acid is apparently no longer used. Fuel oil and kerosene and other petroleum products are used in a large number of plants. When your Honors come to read the record, you will be interested to find the indefinite number of combinations and permutations of oils that have been tried and are today being tried to meet different conditions. One witness testified to trying about a thousand experiments in different combinations of oils. And, may it please the Court, when engineers deal with these combinations, what is it they are after? Is it merely to try and get a froth? Of course not. To merely coat minerals? Of course not. It is to try to get a process that they can use successfully on the ore with which they are dealing. And they compromise on every feature of the process. They compromise on the proportion of the water and of the acid and of the oil; they compromise on the kind of oil or oils to be used; they compromise on the quantity of oil to get the best possible average result. It goes without saying that we cannot have a froth unless we have something to make the froth, unless the oil will froth. But an oil that froths may be one that will not smear the mineral properly and, on the other hand, it may be that there are some oils that will smear minerals properly, but will not give the highest or best froth. What are we told to do by this patent? Is it not this and this only? To take this large class of oils that have a preferential affinity for minerals and experiment and select from them intelligently, as practical men do, and we shall have no difficulty in finding exactly what we need for any par-

ticular problem, provided we use only the "critical proportion" of the oil.

The Hyde record shows that the plaintiffs and their licensees were very careful always to come within these "critical proportions". They used from a minimum of .05 of one per cent to a maximum of .2 of one per cent on the ore; the patent says that the upper limit is five-tenths of one per cent. But there was no talk as to the type or kind of oil; it was any and every oil as to which they advanced these propositions. But more than four pounds of oil (.2 of one per cent) to the ton were not used in practice and over five-tenths of one per cent was impossible, according to the Hyde record.

I have not the slightest doubt that if there is anything at all in this proposition, which the Supreme Court has accepted, that the employment of this minute amount, critical proportion of oil, leads to new and patentable results, it all comes right down to this, that when we use a certain comparatively small amount of oil, that "critical proportion" of oil fits the conditions of operation as a whole better than a larger amount. There are a thousand and one things that are happening in one of these operations and all sorts of actions and reactions between the different elements are going on. Each plant is developed on its own lines and in view of its own problems. Judging from the record, there is as yet no standard whatever as to the kind and not much as to the amount of oil that is used. No two plants, as far as I can see, use the same thing and yet they all get results.

Having through Mr. Higgins' work made the discovery of the "critical proportions", the patentees filed their English application in which they referred, as in their United States patent, to all oily substances which have a preferential affinity to metaliferous substances as the thing to use, and, as they had experimented with oleic acid, named that only as a specific illustration, exactly as in the United States patent. But when they filed their final British specification, which is always a more carefully prepared document, they gave one other illustration

of a specific oil that might be used ; and what was that ? It was " petrol ", a petroleum product, like fuel oil and kerosene, but of less specific gravity. It was in fact gasolene. The patentees then had no doubt that petroleum products such as we use with other oils, were quite the kind required and they said so by naming " petrol " in their final British specification. Meanwhile, they had filed their application in the United States, which was like their first specification in England in that it mentioned specifically only oleic acid. Let us see what the language is that was used in their United States patent.

" This invention relates to improvements in the concentration of ores, the object being to separate metalliferous matter, graphite, and the like from gangue by means of oils, fatty acids, or other substances which have a preferential affinity for metalliferous matter over gangue."

Now, from the argument of my learned brothers, your Honors would certainly expect, when looking into the patent, to see right there in the forefront a statement of the importance of using only those oils and those fatty acids, if there are any, or other substances, if there are any, which are capable making a nice, beautiful froth of the peculiar kind which alone the patentees wanted. That is what might be expected to be there ; but there is nothing of the sort. And that fact is significant. It is a circumstance which is sufficient, particularly when coupled with many others, to persuade me, as I think it will your Honors, that the character of the oil, provided it has affinity with metalliferous matter, is *not material* and has never been thought to be material, that the oils used by the defendant, all of them, are oils of the patent, and that only the exigencies of this litigation have forced the plaintiffs to the contentions that the frothing quality of the oil is alone important and that the fuel oil or kerosene which we use (with other oils) is not just as much the oil of the patent as is oleic acid. As plaintiffs now argue, the thing which is of prime importance and that which stands in the forefront of the patented

invention is to pick out a specially effective *frothing* oil. There was no suggestion in the Hyde case or in any prior litigation or in the opinion of the Supreme Court that, to get results, we must keep away from oils that are not specially good froth makers or anything of that kind. The patent only says to take the critical amount of any oil which has affinity for metallic particles and in other respects do as was done with Cattermole.

The patentees proceed (line 28 of the patent): "We have found that if the proportion of oily substance be considerably reduced—say to a fraction of one per cent on the ore" (what is a fraction of one per cent on the ore? It is clearly not 999/1000. In fact, as I hope to show your Honors, it can only be a fraction of not over .5 one per cent. In the English provisional specification filed about the same time, the patentees say "a *small* fraction of one per cent"), "granulation (which characterized the use of more oil in the Cattermole work) ceases to take place, and after vigorous agitation there is a tendency for a part of the oil-coated metalliferous matter to rise to the surface of the pulp in the form of a froth or scum. This tendency is dependent on a number of factors." Then the patentees, at line 70, page 1 of the patent, give the specific example which is the complete and binding definition of what they mean by "a small fraction of one per cent". There they describe a certain ore which is to be mixed with water, state the amount of mineral acid or acid salt to be used and say "to this is added a very small proportion of oleic acid (say from .02 per cent to .5 per cent on the weight of ore). The mixture is warmed say to 30 degrees to 40 degrees Centigrade and is briskly agitated in a cone mixer or the like as in the processes previously cited (Cattermole) for about 2½ to 10 minutes, until the oleic acid has been brought into efficient contact with all the mineral particles in the pulp". They say, line 96, "the minimum amount of oleic acid which can be used to effect the flotation of the mineral in the form of froth may be under .1 per

cent of the ore; but this proportion has been found suitable and economical”.

Now, in view of that specification, in view of the testimony and of the argument which persuaded the Supreme Court, can there be any doubt as to what is the “small fraction of one per cent” of oil to the use of which the Supreme Court has limited the claims? In this connection what is said on that subject by one of the shrewdest and most intelligent of plaintiffs’ experts, Dr. Charles F. Chandler, the “dean of chemists” as counsel call him, an experienced witness who did all that could be done in support of plaintiffs’ case? He testifies, Volume 2, page 180, as follows:—

“42 X-Q. In treating an ore containing eight per cent of zinc as blende and the remainder consisting of non-metalliferous gangue, what would be the maximum and the minimum amounts of oil per ton of ore to be used according to the instructions appearing in lines 28-30, page 1, of patent No. 835,120, this being the patent in suit? Will you also apply the same question to an ore containing four per cent of zinc in the form of blende?”

A. The patent in suit, as I understand it, does not specify any particular quantity of oil with regard to the percentage of zinc present in the ore. The specification simply gives general indications of possible quantities that might be found useful. In lines 28-30, to which you refer in your question, no specific quantity is mentioned. The inventors simply state, referring to the Cattermole patent which has just been previously discussed, that four to six per cent of the weight of metalliferous matter present is employed, that they have found that if the proportion of oily substance be considered reduced, say to a fraction of one per cent on the ore, granulation ceases to take place. *What this fraction of one per cent is, they do not mention. The only way in which I can interpret this fraction of one per cent is by referring to other portions of the specification, where this fraction of one per cent is expressed in figures,*

for example, at line 81, of page 1, of the specification, is the following statement, speaking of the ore : —

‘ To this is added a very small proportion of oleic acid (say from 0.02 per cent to 0.5 per cent on the weight of the ore) ’.

“ That is, from $1/50$ of one per cent up to one-half of one per cent. The specification does not intimate that these proportions of oil or oleic acid are to be used indiscriminately on the ores. Special directions are given for preliminary tests with different ores and different oils. Consequently it does not follow from the specification that the maximum quantity of oleic acid mentioned would be used on four per cent or eight per cent ores. On the contrary, it is especially stated, beginning at line 96 on page 1 of the specification,

‘ The minimum amount of oleic acid which can be used to effect the flotation of the mineral in the form of froth may be under 0.1% of the ore, but this proportion has been found suitable and economical.’

43 X-Q. We will refer again to lines 28–30 page 1, of the specification of the patent in suit, and in connection therewith I would like you to state whether $9/10$ of one per cent is not ‘ a fraction of one per cent ’?

A. It certainly is, *but the paragraph does not indicate that that is the fraction that the inventors refer to. We have to seek further information in the specification to ascertain what particular fraction they are referring to by the expression ‘ a fraction of one per cent ’.*

So that that fraction of one per cent, may it please the Court, is, as Professor Chandler says, inevitably less than one-half of one per cent; it may be one-tenth of one per cent, but it is clearly less than one-half of one per cent. We contend that “ a fraction of one per cent ” means in the patent and its claims exactly what Professor Chandler found it to mean,

namely, a fraction not over five-tenths of one per cent. We contend that that is exactly what the Supreme Court decided and that in so far as we have used more than five-tenths of one per cent of oil (it seems too clear for argument that no infringement is possible if over one per cent is used), we have not infringed. We have not infringed, therefore, in any of our operations since we gave up using minute quantities of oil, a few days after the decision of the Supreme Court instructed us as to the true construction of the patent.

The first claim of the patent is as follows:—

“The herein-described process of concentrating ores which consists in mixing the powdered ore with water, adding a small proportion of an oily liquid having a preferential affinity for metalliferous matter, (amounting to a fraction of one per cent on the ore”), not any fraction of one per cent, but the fraction they there refer to, namely, less than .5 of one per cent — “agitating the mixture until the oil coated mineral matter forms into a froth, and separating the froth from the remainder by flotation.”

There, again, there is no suggestion as to the selection of an oil because it has more or less “frothing” qualities. We are to take any oil which has the required affinity for metalliferous matter and get the froth which comes from the use of that oil. That represents one class of the claims. That claim and other like claims were sustained by the Supreme Court.

Now, if your Honors will turn to Claim 9 of the patent:—

“9. The process of concentrating powdered ores which consists in separating the mineral from the gangue by coating the mineral with oil in water containing a small quantity of oil, agitating the mixture to form a froth and separating the froth.”

That claim and also Claims 10 and 11 which are like it, the Supreme Court held to be invalid. Using a “small quantity” is not enough. To practice the invention or to *infringe*, the

critical proportions, as set out in the patent and disclosed in the testimony in the Hyde case, must be used. It is interesting, may it please the Court, to see that in plaintiffs' efforts to get that Claim 9 (Claims 10 and 11 are like it in naming a "small quantity" of oil) sustained in the Supreme Court, they portrayed to the Court the exact situation existing in this case, and asked the Court to sustain the three broad claims that were declared to be invalid in order to protect them in just the emergency that here exists. Here is what plaintiffs said, and I read from our brief at page 40: —

"Claim 9 is the *broadest claim*. The amount of oil is stated to be 'a small quantity'. The process is stated to include 'coating the mineral with oil in water containing a small quantity of oil, agitating the mixture to form a froth and separating the froth'. The essentials of agitation of the ore in powdered form diffused in water in the presence of a small quantity of oil, so as to form a froth and thereby to utilize air bubble separation, are set forth, as well as the completion of the operation of concentration or separation by separating the froth. The novelty of the invention as thus defined is unquestionable. Conditions may well arise in the future wherein" — they said this to the Supreme Court and it was in view of this argument that the Supreme Court said that claim was invalid — "*conditions may well arise in the future wherein the critical oil proportion is increased by reason of a useless absorption of the oil within the pores of a gangue material, or wherein an oil or a mixture of oils is employed having unusual characteristics, as a result of which the critical oil proportion may be one per cent or slightly more. Under such conditions this and the two following claims (10 and 11) may be necessary to protect the invention*".

But the Supreme Court said no; when that condition arises, the invention will not be used. The public has a perfect right to use a small quantity of oil in what is in other respects the

patented procedure, based on Cattermole. There can be no claim in this patent that will cover an alleged process unless the vital point of that process the "critical proportions" of oil are employed. That was the invention and it was but a single step from the prior art and not a long one. That was what the Supreme Court decided, and because it so decided (and on that ground only), Claims 9, 10 and 11 were declared invalid. The effect of the decision was to give to the patentees a monopoly of the invention which, as they argued, and as the Supreme Court found, they had actually made. They control, under the patent, all the advantageous results that follow from the use of less than .5 of oil to the weight of ore. We have none of that advantage. The plaintiffs say that we are losing money, a million dollars a year, all the time because we do not use the invention (see our brief, pp. 22-25). We prefer to stand this loss rather than to pay the plaintiffs the price they ask for a license to use the invention. We sacrifice the advantages of this invention, because the Supreme Court has said that the employment of this critical proportion of oil belongs to the plaintiffs. We get along without it, as we have the right to do, and pay the penalty, according to the plaintiffs, by increased cost and reduced profits.

Your Honors now so well understand the nature and character of the decision of the Supreme Court that I shall say only a word further on the subject. The Court's opinion begins on page 105 of this volume of printed opinions. I will pass over what they say about the prior art simply with this remark: I earnestly urge your Honors to start out in the study of this case, *first*, from the point of view that Claims 9, 10 and 11 were declared invalid by the Supreme Court with consequences that are controlling in every branch of the present case; and, *second*, by reading the opinion of your Honors in the Hyde case (page 17 of the volume of printed opinions), which is a complete and adequate discussion of the entire situation then before the Court, and which, I respectfully submit, is affirmed and accepted by the Supreme Court

except in a single particular. In this Court's former opinion will be found a full discussion of the prior art which I do not think can be improved upon. This Court's view of the prior art was, I think, clearly adopted in substance by the Supreme Court, as the basis of its finding, that the "final step" taken by the patentees "was not a long one" and that therefore the patent must be strictly limited to the use of oil in the "critical proportions", so that Claims 9, 10 and 11 were invalid. This Court held that the use of a minute amount of oil instead of a larger amount was only a "question of degree" and therefore not patentable. The Supreme Court, recognizing, as did this Court, that the entire alleged invention of the patent resided in the use of this specific minute quantity of oil, was persuaded that thereby there was produced a new and important result, differing in kind from what went before. In that respect and in that only it differed from this Court.

On page 108 of the Volume of Opinions, the Supreme Court says that "the process of the patent in suit, as described and practiced, consists in the use of an amount of oil which is 'critical' and minute as compared with the amount used in prior processes". Now, let us stop there for a moment. The invention "consists in the use of an amount of oil which is 'critical' and minute as compared with the amount used in prior processes". If we do not have that as part of our process we do not have the invention. It is just exactly as if it was a combination patent for the combination of elements A, B and C. One who does not use A, does not infringe; so here, if we do not use the "critical proportions" of oil, we do not infringe, whatever else we may do, for that is an essential step in the process.

The Court proceeds: "and in so impregnating with air the mass of ore and water used, by agitation — 'by beating the air into the mass' — as to cause to rise to the surface of the mass or pulp a froth, peculiarly coherent and persistent in character", — all of which comes, as the plaintiffs then insisted, from the use of the "critical" amount of oil; there was no pretense

that the result could be attained in any other way —“ which is composed of air bubbles with only a trace of oil in them, which carry in mechanical suspension a very high percentage of the metal and metalliferous particles of ore which were contained in the mass of crushed ore subjected to treatment ”.

All these words describing the froth are apt for the froth of Cattermole and the prior art except that “ there was only a trace of oil ” in the patentees’ forth and it was more “ coherent and persistent ” (a difference in degree only) and except, as the patentees contended, they got far more mineral in the froth and by the process. That last is an important difference. An invention by which one is able to get out an unusually large quantity of mineral is an important invention. But all this novelty, merely in degree, in the froth, comes back to the single point of the presence and action of the new thing, the use of oil in the “ critical proportion ” only, which it required by the patent. As to agitation, that was old in the prior art. The plaintiffs have asserted here that the agitation in the Cattermole process was just the same as in that of the patent and that the Supreme Court did not imply the contrary, but was referring to other items in the prior art when it spoke of the agitation of the patent in suit as being of a special character.

The Supreme Court finally concludes, page 115: “ While we thus find in favor of the validity of the patent, we cannot agree with the District Court in regarding it valid as to all of the claims in suit. As we have pointed out in this opinion there were many investigators at work in this field to which the process in suit relates when the patentees came into it, and it was while engaged in study of prior kindred processes that their discovery was made. While the evidence in the case makes it clear that they discovered the final step which converted experiment into solution, ‘ turned failure into success ’ ” — that is the step from Cattermole, Froment, Everson, Kirby and others — “ yet the investigations preceding were so informing that this final step was not a long one and the patent must be confined to the results obtained by the use of oil within the

proportions often described in the testimony and in the claims of the patent as 'critical proportions'".

"One pound to four pounds", that is what is in the testimony. "Five-tenths of one per cent to two one-hundredths of one per cent", that is what is in the patent. The phrase of the patent "amounting to a fraction of one per cent on the ore" means clearly a fraction of less than five-tenths of one per cent. Could anything be more certain?

The Court says that Claims 9, 10 and 11 are invalid. It says that the great, fundamental feature of the invention was the discovery of the remarkable results arising from the use of this "critical proportion" of oil which was hit upon by Mr. Higgins in his series of tests of what would happen if in practising the Cattermole process the amount of oil was reduced by gradations down to the vanishing point. That is the great thing. Because of it, there was a patentable process, and on that ground, and on that ground only, the patent was sustained. But in spite of the fact the Court was warned by counsel that some one might come along and use a greater amount of oil, say, over one per cent, of which some part might be unnecessary and ineffective and go to waste, and plaintiffs' plea that the claims with the phrase "a small quantity" in them should be sustained to meet that situation, the Supreme Court said: "No; we have defined this invention. It involves the presence of an oil or oily substance which has a 'preferential affinity for metalliferous matter' when used in the 'critical proportions' which are so clearly set out in the testimony and the patent. We declare the patent limited to that feature. The claims that are not clearly so limited we declare invalid."

Of course, there is nothing in the decision of the Supreme Court which excludes from the scope of the patent any oil or oily substance which has a preferential affinity for metalliferous matter over gangue. The terms of the patent itself made that impossible. There was no evidence and no contention that any such oil was outside the range of the patent. The proposition now advanced that fuel oil, or other petroleum products such

as we use, are not the oils of the patent is altogether new. It is advanced as part of the plaintiffs' argument, altogether fallacious as it seems to us, that because some fuel oil or some kerosene may not "froth" as well as some other oils, we can not count such oils in figuring our percentage of oil to ore. But the complete answer is that the patent makes no such distinction and the record shows that fuel oil and kerosene (the patentees specifically named "petrol", another petroleum product, in their final British specification and nothing else except oleic acid) do froth. Some may froth more than others and some oily substances may froth more and some less than fuel oil or kerosene. But the patent is concerned only with the froth, whatever it may be, that *comes from the oil that is used*, but its scope is limited to the employment of the critical proportions; and frothing is only one function of the oil in the patented process. It must exercise its affinity for metalliferous matter and some oils undoubtedly have a greater such affinity than others. It must be cheap and accessible at the place where the process is to be practised. The whole matter is a compromise and what is established in this case is that we use oils of the patent, but that we avoid infringement of the patent as construed by the Supreme Court by reason of the large proportion of oil to ore which we use. We do not use oil in the "critical proportions" required by the patent and do not infringe. As to our froth, it is exactly that froth which inevitably follows from the use of the amount and kind of oil that we use in the environment in which we use it. It cannot be the froth of the patent which comes only when the "critical proportions" of oil are employed. I again call the Court's attention to the infinite variety of oils and combinations of oils which the record shows have been employed in this art, and to the fact set out in our brief (pages 41-48) that petroleum products have been generally used and recognized as useful in flotation processes.

It is unnecessary for me to say that this patent is in no sense for a froth. However persistent, effective and beautiful the froth may be which is produced by the practice of the inven-

tion, that is not the subject of the patent. The patent is for the *process*, one stage of which involves the presence of a froth only new to the extent to which its precise and specific character is determined by the use of oil in the "critical proportions". To infringe that patent, all the steps of the process must be employed, and if any substantial step is omitted, there is no infringement. We do not infringe because we depart from the patent in the particular which the Supreme Court has determined to be that upon which alone novelty and invention can be predicated. While we use oil of the character required in the patent, we do not use it in the "critical proportions" in which it must be used to practise the invention. We have found a mixture of oils which works fairly well on our ore. We get results that the plaintiffs say are much inferior to what we might get if we used their process. If such is the case, we deliberately sacrifice efficiency rather than pay the price which the plaintiffs would exact as a license fee.

We keep entirely out of the domain established for the plaintiffs by the decision of the Supreme Court. We do not use the plaintiffs' process for we use far more than the "critical proportions" of oil which is essential to that process. But they say that some of that oil goes to waste or is ineffective. That fact is not established by the record; but even if true, I again remind your Honors that Mr. Kenyon told the Supreme Court that he wanted to have Claims 9, 10 and 11 sustained because somebody might do just what we are doing, according to his present contention, use a large amount of oil, some of which would go to waste or be otherwise ineffective. But in spite of that plea, Claims 9, 10 and 11 were declared invalid with the effect that even if more oil is used than is necessary to produce some *other result*, he is not an infringer who uses that greater quantity of oil and is satisfied with the result which he gets.

I respectfully submit that such is the inevitable logic of the opinion of the Supreme Court based upon the grounds which I

have attempted to set forth. How can it be otherwise when the patent and the whole record before that Court were definitely to the effect, not that the matter of frothing oils, as distinguished from some other oils, was in question or that any attention was to be paid to the frothing quality of the oils, but that there was a great discovery found in practising the Cattermole agitation method of separating minerals when the amount of oil was reduced to these "critical proportions". The Supreme Court declared that to be a new thing and entitled to patent protection. The defendant contended that it was not new, that it was anticipated by Froment, by Everson, by Kirby and the rest of the prior art, and that for that reason the Court ought to say that there was no patentability. But the Supreme Court refused to follow the defendant to that extent, reversing this Court on the single point that the discovery of the "critical proportions" was not a mere matter of degree. In all other respects, I respectfully submit that the Supreme Court followed this Court.

The matter of the disclaimer is intimately interwoven with the other questions in the case. Mr. Bull read to your Honors from page 51 of that brief of the appellees, which is called a supplemental brief, where they analyze Claims 9, 10 and 11 as the same are affected by the disclaimer and, I think, clearly themselves show the extravagant breadth of those claims, as modified by the disclaimer, in view of the decision of the Supreme Court. The phrase "a small quantity" is still in the claims and if the disclaimer has any force whatever, it surely does not define that "small quantity" so as to bring it within the "critical proportions" which, as the Supreme Court insisted, characterize the invention. That was the only and the specific point to which a disclaimer should have been directed. The disclaimer, on its face, leaves the claims in shape to cover any quantity of oil, however large and however much in excess of the "critical proportions", provided anyone could call it a "small quantity". if the results obtained are those that would be obtained by the use of the critical amount of oil. We con-

tend that the claims are just as broad as they were before this disclaimer if not more broad, and that therefore the disclaimer is ineffective, is no disclaimer at all, and that the plaintiff had no standing, under the patent, to bring this suit and has now no standing in this Court. This bill, therefore, must be dismissed. Further we contend that the plaintiff not having filed a disclaimer within a reasonable time (it has filed no real disclaimer up to date), the invalidity of the patent can now never be cured.

In the court below, Mr. Kenyon said to the Court, as appears from Volume 8, page 4695, of the record, where he is speaking about the three Claims 9, 10 and 11, as they stood after the disclaimer :

“Now, the relation of these three claims as limited by disclaimer to the other claims is, as your Honor has certainly held in dealing with this matter of disclaimer, that these three claims certainly cover and included in their original form what the other claims covered and included. They cover and include all of them.

“And if they differ from these other claims” — that is, the other claims in the patent in suit — “they differ only in covering more. Now, by disclaimer we have cut down that ‘more’ to something less than it was originally, but still not to something less than these other claims. *It still remains that these claims 9, 10, and 11 as limited by disclaimer are, if they differ at all from the other claims, broader than the other claims.*”

They are still capable of being construed as the broadest claims in the patent, they say.

I respectfully submit that it was almost playing with the Supreme Court to file a disclaimer of that sort, which left the matter in such shape that counsel are able to argue that Claims 9, 10 and 11, after the disclaimer, are broader than the other claims in the patent ; when, as your Honors will remember, that what the Supreme Court says is very plain, indeed : —

“Therefore, the decree of this court will be that the patent is valid as to claims Nos. 1, 2, 3, 5, 6, 7 and 12, and that the defendant has infringed those claims, *but that it is invalid as to claims 9, 10 and 11.*” And why are those claims invalid? Because “The patent must be confined to the results obtained by the use of oil within the proportions often described in the testimony and in the claims of the patent as ‘critical proportions’.”

Your Honors understand that when the Supreme Court had said that these claims were invalid the patent immediately became moribund, so to speak; that is, it would surely die unless *within a reasonable time* a proper disclaimer was filed; and during that reasonable time that might elapse before the disclaimer was filed, nothing could be done to enforce the patent; no decree could be entered in the Hyde suit; no new suit could be brought or anything done until a proper disclaimer was filed. And if the disclaimer was not filed within a reasonable time, the patent was for all time invalid. Plaintiffs had it in their power to go to the Patent Office and file a disclaimer cancelling these claims. If they filed a proper disclaimer within a reasonable time, the patent, as reformed by the disclaimer, would be in force for the remainder of the term with the scope and effect given to it by the decision of the Supreme Court. If a proper disclaimer was not filed within a reasonable time, the entire patent became invalid and of no force or effect whatever. A disclaimer which made these claims exactly like the other claims of the patent would be nonsense; but the plaintiffs now insist that this Court, as an act of grace, may construe the disclaimer as having just that effect, if otherwise your Honors would be of the opinion that the disclaimer was so vicious as to be no disclaimer at all. We respectfully submit that the Court should not take that point of view.

The situation seems clear. The plaintiffs deliberately elected to make an effort to have their cake and to eat it, too. That

may sometimes be possible in litigation, but not generally where the question is one of carrying out the orders of the Supreme Court of the United States.

Plaintiffs deliberately elected to file a disclaimer which would, on its face, not comply with the order of the Supreme Court of the United States, but which would leave it open for them to argue, as they have practically argued in this litigation, that Claims 9, 10 and 11, after the disclaimer, were broader than the others which were sustained by the Supreme Court, in that they (even after the disclaimer) were *not* limited to the use of the "critical proportions" of oil so much emphasized by the Supreme Court, but were to be construed as covering a process in which one, two, three or more per cent of oil (in fact, any percentage that might be called a "small quantity"), was employed, provided the result of the operation of the process was that called for by the patent. And they undoubtedly proposed to argue that such "result" would be obtained if any one carried on flotation by the agitation of air, oil, ore and water with quantities of oil in excess of the "critical proportions", thereby producing a useful froth, even if that froth did not have the peculiar characteristics inevitably imposed upon the patented froth by the employment of oil in the "critical proportions". It seems to us that this is the obvious meaning and intended force of the disclaimer.

Of course, the plaintiffs now assert that if there is danger of the Court taking this view, your Honors may as an act of mercy construe the claims as affected by the disclaimer as if they were identical with the other claims. It does not seem proper that your Honors should in any event take that view of the force of the disclaimer.

It would have been easy for the plaintiffs to have filed a disclaimer that would have exactly complied with the spirit and letter of the Supreme Court's order, but that certainly was not done.

I respectfully submit, may it please the Court, that when your Honors consider the disclaimer and its effect upon these

claims, you will determine that the disclaimer is not drawn so as to limit the invention of the patent in suit, which is purported to be covered by these claims, to the "critical proportions" or the result of the use of these "critical proportions"; but it is certain that what the Supreme Court meant was that there could not be a claim in this patent that did not involve as a necessary feature the employment of oil within the range of the "critical proportions" and that so long as the quantity of oil was defined by the phrase "a small quantity", the "critical proportions" were not in the claims.

Is it not perfectly clear that the disclaimer filed does not at all accomplish the result of changing "a small quantity" into "critical proportions" of oil, whether those "critical proportions" are expressed in the phrase "a fraction of one per cent" or in any other way? Obviously what is hoped to be the effect of that disclaimer is that if the user of a flotation process employs five per cent of oil (for five per cent may be said to be "a small quantity") and by the use of that five per cent gets good "results", in the form of large recoveries ^{and} of the kind of a froth that he wants, such being the "results" (in a vague sense) which according to the patent and the record are obtained if two-tenths, or three-tenths of one per cent of oil is used, then Claims 9, 10 and 11, as affected by the disclaimer, would cover the process so that he who used the five per cent would be an infringer even if he did not infringe the other claims.

The plaintiffs undoubtedly feared, simply carrying out the thought that was expressed to the Supreme Court in their argument to which I have already referred (which thought failed utterly to influence the Court), that some time or the other the Butte & Superior Company or some one else might say "we cannot afford to pay what the patentees demand for a license. It is better for us to work out a process of our own with our own peculiar methods of manipulation, with our own special machinery and with our individual selection of oils, by which we can secure flotation that is good enough for us, using such a large amount of oil that we shall have gotten away from

the 'critical proportions' to which the patent is limited but losing the advantage, if there is any, which might be derived from the use of this critical amount of oil; having more than five-tenths of one per cent we shall, whatever may be our loss, endure that sacrifice, as every one does when he cannot afford to take a license and avoids infringement by avoiding the patent and not getting the benefit of the patented invention". And the disclaimer was ingeniously drawn so that, in that event, Claims 9, 10 and 11 might be said to be infringed, on the theory that the "result" was alone important, five per cent being a "small quantity" although not within the critical proportions.

That is our position, may it please your Honors, and I ask your Honors to recognize that if this disclaimer is not a proper disclaimer, the situation is exactly what it would be if no disclaimer had been filed; in which case the plaintiffs, having no patent at all (for it was invalid) had no right to bring this suit, had no right to any decree and no status under the patent. We insist that *no* real disclaimer of Claims 9, 10 and 11 having been filed, *no* disclaimer having been filed which modified those invalid claims so that they were limited, as the Supreme Court said they must be limited, the bill in this case must be dismissed. Such is the law as laid down in the authorities cited in our brief.

Moreover, the patent should now be declared finally invalid, because there has been a clear and absolute lack of diligence in filing a proper disclaimer. It may well be that if the pretended disclaimer had been a real disclaimer, had been any disclaimer at all within the meaning of the statute, the delay of a hundred days or so after the decision of the Supreme Court and before the filing of the paper, would not have been unreasonable. The plaintiffs were entitled to time to determine what to do; but to take the hundred days and then to file such a paper as this, which, I submit, is no disclaimer at all, exhausted plaintiffs' rights. Any further delay was clearly unreasonable. And now years have elapsed with no real disclaimer filed. This suit

has been tried and carried to this Court on a patent which, as we respectfully submit, still had in it claims which are invalid under the decision of the Supreme Court, for the reason that "a small quantity" now means, as it meant before the alleged disclaimer was filed, a greater proportion of oil than the "critical proportions" which alone could give validity to any claim in the patent. The Supreme Court so read Claims 9, 10 and 11 before the alleged disclaimer. We respectfully submit that this Court should now so read the claims, after the so-called disclaimer, and that the bill in this case should be dismissed.

APR 30 1918

HONORABLE ERSKINE M. ROSS, WILLIAM W. MORROW and WILLIAM H. HUNT, JUDGES OF THE CIRCUIT COURT OF APPEALS FOR THE NINTH CIRCUIT.

Minerals Separation, Limited, et al., vs. Butte & Superior Mining Company—No. 3081.

SIRS :—

We have received copies of plaintiffs-appellees' letter to your Honors, dated April 6, 1918, which is, in effect, a supplemental argument. We do not wish to enter upon a battle of briefs, and would much prefer to let the matter rest where it is; but appellant is entitled to the last word and the importance of the case to the American mining public is such that we feel we must leave no stone unturned in our effort to assist the Court in dealing with the extremely large record in this case.

The purpose of the latest argument for the plaintiffs is to convince the Court that the proofs in this case establish the proposition that mineral oils will not produce a froth, and are not useful for concentration purposes, although it is admitted that they have a "preferential affinity for metalliferous matter", and that larger quantities of oil than a small fraction of one per cent., except in the case of mixtures of oils, are not permissible in the agitation-froth process. The exact contrary to these propositions is established in the record, as we have shown in our main brief, supplemented by our typewritten memorandum handed up during Mr. Bull's oral argument. As these references to the record are now scattered through our brief and type-written memorandum, it seems to us that the best reply we can make to plaintiffs' arguments, and the best service we can render to the Court is to collect these scattered references together and repeat them here without argument. This will not be new argument, but only old argument rearranged.

Crude petroleum as it comes from the wells is divided by what is termed "fractional distillation" into various grades, which are known in commerce as "gasolene", "kerosene" "fuel oil", "lubricating oil" and "residuum". That is to say,

when crude oil is heated to say, 350° F., a certain amount of vapor is driven off and that vapor when condensed is sold as "gasolene". When the remainder is heated to say, 600° F., a certain additional amount of vapor is driven off and that vapor when condensed is sold as "kerosene". When the remainder is heated to certain higher temperature, an additional amount of vapor is driven off and that vapor when condensed is sold as "fuel oil". Higher temperatures yield "lubricating oil". That which is left after the "lubricating oil" has been distilled off is known as "residuum". These several grades differ from each other, therefore, only in their boiling points. That these various grades of petroleum (mineral) oils all have a "preferential affinity for metalliferous matter" is now admitted, and that all these various grades are useful in affecting froth concentration is affirmed or admitted by both plaintiff's and defendant's witnesses.

That petroleums (mineral oils) will produce froth and effect concentration is fully established out of the mouths of the patentees and plaintiffs' other witnesses :

Thus, the patentees, Sulman and Picard, in their report to the chairman of Minerals Separation, being the first written description of the invention at bar, said (Tr., Vol. III., page 1118) :

"We may here conveniently note that other oils besides oleic acid may be employed in this modified recovery process, but so far as Broken Hill is concerned, Oleic acid gives by far the best results. *Petroleum residuum* added as emulsion, *paraffine oil* alone, R_3P_1 and R_1P_3 emulsions,* have also been used, and all give small proportions of float, but do not act nearly so vigorously or efficiently on Broken Hill ores as plain Oleic acid."

The complete specifications of the British patent which corresponds with the patent in suit describe in the working

* "Petroleum residuum" referred to above is the heavier fractions left in the still after the gasolene and kerosene have been distilled off. "Paraffine oil" above referred to is the English name for *kerosene*. " R_3P_1 " means a mixture of three parts residuum and one part paraffine oil, and " R_1P_3 " means a mixture of one part residuum and three parts paraffine oil.

example the use not only of oleic acid but of "*petrol** or other suitable oil" (Tr., Vol. III., page 1279, line 38). This statement is repeated in the specification several times and also in the claims (See p. 1279, line 40 ; p. 1279, line 47 ; p. 1279, line 56 ; p. 1281, line 13 ; p. 1281, line 20 ; p. 1281, line 26).

The patent in suit starts out (page 1, line 16) by referring to the Cattermole patents and says (line 28) : " We have found that if the proportion of *oily substance* be considerably reduced," etc., the results of the patent in suit will be realized. This refers us directly to the said Cattermole for further information as to what are the " oily substances " referred to, and going there we find (Tr., Vol. IV., page 2138, line 89) the " oily substance " described as follows :

" The ' oil ' used may be animal, vegetable or *mineral* oil or *mixtures of these* or such coal or wood tar products or other substances which exercise, like oils, a preferential physical affinity for metallic mineral matter as distinguished from gangue."

Further on, the specifications of the patent in suit say (p. 1, line 61) :

" The proportion of mineral which floats in the form of froth varies considerably with different ores and *with different oily substances*, and before utilizing the facts above mentioned in the concentration of any particular ore a simple preliminary test is necessary to determine *which oily substance* yields the proportion of froth or scum desired."

When we come to the claims we find that they define the oil as "*an oily liquid having a preferential affinity for metal-liferous matter.*"

Sulman, one of the patentees of the patent in suit, in a subsequently issued patent (No. 835,143), (Vol. IV., page 2169, line 15) says, referring to the patent here in suit :

" In the process described in the specification of the previous patent application, Serial No. 262,889, filed

* "*Petrol*" is the English name for *gasolene*.

May 29, 1905,* a mineral pulp is agitated with a small proportion of an oily substance, such as oleic acid *or petrol or other oil*, amounting to a fraction of one per cent. on the ore," etc.

Plaintiff's engineer, Higgins, testifying in the Hyde case (Vol. IV., page 1811), said :

" Q. 110. What other oils ?

" A. I have obtained satisfactory results by the use of *petrol*, certain portions of the distillate of *crude petroleum*, such as *cosmos oil*, vegetable oil, such as palm oil, cotton-seed oil, linseed oil and animal oils, such as lard oil, and oil squeezed from beef fat.

" Q. 111. Have you been successful in the use of eucalyptus oil ?

" A. Yes.

" Q. 112. Is the petrol to which you refer the distillation product of petroleum, sometimes known as 'gasolene' ?

" A. The petrol I refer to is one of the lightest constituents of crude petroleum. I do not know whether gasolene is the same material.

" Q. 113. The petrol you refer to is the distillation product commonly used in internal combustion engines, such as automobile engines, is it not ?

" A. Yes, it is known as .680 spirit.

" Q. 114. Is the 'paraffine' referred to in Higgins' Report, March 16, 1905, the same as lighting oil or kerosene ?

" A. Yes."

* * * * *

" Q. 117. Can you state what the smallest quantity is of eucalyptus oil that will produce a froth, operating upon, say, some one of the Broken Hill ores with which you have experimented ?

" A. The smallest quantity of eucalyptus which I have found in my experiments on Broken Hill ore to give a satisfactory concentration as a froth, is half a pound to the ton of ore.

" Q. 118. Would you obtain equally good results on the same ore using one-half pound of *Cosmos oil* ?

* The "specification of the previous patent application" here referred to is the specification of the patent in suit.

"A. Speaking from memory, I believe the results on *Cosmos oil* may have been a little lower when such a quantity of oil was used.

"Q. 119. Will *Cosmos oil* in any quantity give as good a recovery as eucalyptus oil?

"A. Yes, I think so.

"Q. 120. You would have to use more of the *Cosmos oil* than eucalyptus oil?

"A. I am not certain that I should do so. I have not made comparative experiments with these two oils, and it is possible that the same results might be obtained in different periods of time for the agitation.

"Q. 121. What is *Cosmos oil*, that is, what is its origin, and what is it used for?

"A. It is a *petroleum distillate*, sold for lubricating purposes.

"Q. 122. Is it what is sometimes called cylinder oil?

"A. I do not know. I think it is more in the nature of a valve oil.

"Q. 123. Is the *Cosmos oil* the Standard Oil Company's *Cosmos oil*.

"A. Yes, the samples were obtained from their London firm, the Anglo-American Oil Company."

Plaintiff's witness Higgins, further says in this case, that petroleums (fuel-oil and kerosene), when used with a vegetable oil are useful in the process in the patent in suit for the purpose of "*preventing the coarse mineral from falling out of the froth*" (Tr., Vol. VIII., p. 4738, Qs. 39 and 40); that it prevents "showering"—that is, it helps to keep the mineral from falling out of the froth (Tr., Vol. VIII., p. 4606, Qs. 421 and 422).

Furthermore, plaintiff's witness Chapman, says in this case concerning petroleum (Tr., Vol. VIII., p. 4436, Q. 38):

"I have on many occasions used inactive oils, particularly those like fuel-oil, kerosene and stove-oil to produce a *condition of froth* in the Spitz box that will maintain a condition of overflow. The addition of these re-agents in small quantities is *extremely useful* for the purpose, and considerably eases up the operating work."

That petroleum (mineral oils) will produce froth and affect concentration is also fully established by the testimony of defendant's witnesses :

Phillips, defendant's witness, was put on the stand to identify certain photographs he had made of froths. These froths, made simply for the purpose of photographing them, were produced in a bar-mixer. One of his experiments was known as No. 18, and the photographs obtained in that experiment are in the record as Exhibits 100, 101 and 102 (Vol. IX., pp. 5116, 5117 and 5118). In this experiment 25% of kerosene was used. The experiment was repeated in Court and a good froth was produced (Vol. VI., pp. 2921 to 2923). Plaintiffs' witnesses in rebuttal contended that this kerosene was contaminated with some soluble frothing agent although it was in so small amount they were not able to isolate it ; and they contended that the presence of this contaminant was responsible for the froth produced in Phillips' experiment in Court (Vol. VIII., pp. 4618 and 4619). The kerosene in question had been obtained by Phillips from Dosenbach. Dosenbach when he was on the stand was cross-examined about this kerosene, and he stated (Vol. VII., pp. 3890 to 3892) that it was taken from the regular stock of kerosene at the plant ; that nothing had been added to it, although the storage tank in which it was put when it was received might previously have contained another oil. In surrebuttal, defendant examined its expert, Dr. Sadtler, concerning this kerosene, and he testified that by extremely careful analysis he found it to contain .012 of one per cent. of impurities (Vol. VIII., pp. 4786 to 4789). He further testified that the impurity might be paraffine and not a foreign substance (Vol. VIII., p. 4802, Q. 11). He further stated that since in the Phillips experiment 25% of kerosene was used, the percentage of impurity present on the ore was 25% of .012% ; or, in other words, was three one thousandths (.003) of one per cent. on the ore (Vol. VIII., p. 4803, Q. 11), and that so small a quantity could not have had any possible effect in the production of froth in the Phillips experiment (Vol. VIII., p. 4802, Q. 11). To set this matter finally at rest, defendant asked Dr. Sadtler to repeat the Phillips test, using a sample of this

kerosene which had been *double-washed*, so that it could not possibly contain any contaminant (Vol. VIII., pp. 4787 to 4790). This was violently objected to by plaintiffs' counsel, and the Court sustained the objection (Vol. VIII., pp. 4791 to 4801). As we have said in our main brief (p. 62), this was clearly error, because we believed when Phillips made his experiment that the kerosene was absolutely pure (indeed, it was commercially pure) and we had no reason to expect such an attack as was made upon it. The doctrine of surprise entitled us to show that if the kerosene was impure, the impurity did not affect the result of Phillips' experiment.

This Court will not overlook the fact that when plaintiffs' expert Higgins repeated here before it Phillips' 25% kerosene experiment in a bar-mixer, using not our alleged contaminated kerosene but plaintiffs' own kerosene, he obtained precisely the same results which Phillips obtained and which he (Higgins) had criticized. If Higgins succeeded in obtaining different results in his test before the District Court, all we can say is that he lost the trick in the interval, because it will be remembered he stated he used before this Court the same kerosene he had used before the Court below. The simple facts about kerosene are stated by Dr. Sadtler in testimony quoted in our brief at pages 62 and 63. Kerosene produced from some crude oils, or subjected to some special treatment in the process of refining it, will not produce a froth; but, according to Dr. Sadtler's experience, three kerosenes out of four will produce voluminous froth.

Furthermore, defendant's witness, Dosenbach, also made an experiment in the Court below using 25% kerosene or petroleum distillate and agitating it in the square-glass-jar machine. He obtained "a very copious highly-mineralized froth" (Vol. VI., p. 3300, Q. 58 to p. 3303, Q. 61). Not only did he obtain such a froth and gives samples of it to the other side, but he produced an analysis of it. The experiment is known as No. 32, and the analysis appears in Defendant's Exhibit No. 304 (Vol. IX., p. 5542, opposite the title "Kirby, Test No. 32"). The ore used was Utah copper containing 5.87% copper, 6.76% iron and 75.4% gangue ("Insol."). The assay of the con-

centrate showed that it contained 23.94% copper, 23.5% iron and 21.0% gangue ("Ins."). By this process, therefore, the copper content was raised from 5.87% to 23.94%, and the iron content was raised from 6.76% to 23.5%. Adding these figures together we see that the mineral content was raised from 12.63% to 47.44%, while the gangue content was reduced from 75.4% to 21.0%.

That petroleum is not, as contended on behalf of plaintiffs, inert in the process, is also clearly demonstrated by the mill operations at the Arthur Plant of the Utah Copper Company, records of which appear in Defendant's Exhibit 31 (Tr., Vol. IX., p. 4994), which are explained Transcript, Vol. V., p. 2555, Q. 59 *et seq.* In one run (Experiment No. 7) the oil used was 20.33 pounds per ton, it being a mixture composed of 89% of what plaintiffs' witnesses call inactive oils; that is, petroleum (30% Jones fuel oil and 59% smelter fuel oil), and 11% of what they call active oils (10% American creosote and 1% Yaryan pine oil). In this run the extraction was 98.4%, and the tailings carried 0.076% copper. The actual amount of so-called inactive oil used per ton was, therefore (being 89% of 20.33 pounds), 18.1 pounds, and the actual amount of so-called active oil used per ton was, therefore (being 11% of 20.33 pounds), 2.23 pounds. In another run (Experiment No. 20) *substantially the same amount of so-called inactive oil was used alone* (17.84 pounds of a mixture of the same petroleum; *i. e.*, smelter fuel and Jones fuel in the same proportions). *In this case the extraction was 95.06% and the tailings carried 0.306% copper.* In another run (Experiment No. 17) *substantially the same amount of so-called active oil was used alone* (1.97 pounds of a mixture of the same so-called active oils; that is, American creosote and Yaryan pine, in the same proportions). In this case the extraction was 85.72%, and the tailings carried 0.81% copper. These determinations are not contradicted or questioned, and they prove that the petroleum oil used in this process was by no means inactive or inert. They prove it was, indeed, quite as active and quite as efficient in producing the desired results as was the so-called active oil. Indeed, it will be observed that the petroleum when used alone gave higher extraction than

did the so-called active oils when used alone. The highest extraction, however, was attained when they were used together in a mixture, as defendant uses them.

In direct contradiction of the theory of plaintiffs' witnesses that petroleum is in inactive oil and plays no part in the production of foam, Wicks describes what happened one day in the mill of the Chino Copper Co. in the regular course of mill operations when the supply of petroleum was unintentionally shut off. He says the foam immediately disappeared, and no recoveries were obtained until the supply of petroleum was turned on again. At that time they were using 32.27 pounds of oil per ton of ore (Tr., Vol. V., Qs. 87-91, p. 2433).

Defendant's witness Puncheon described similar occurrences intentionally produced in the regular course of mill operations at the Arthur plant, where a mixture of vegetable and mineral oils like that used by defendant was being employed. He says (Vol. VII., p. 3850, Q. 8 to Q. 20) that when the supply of mineral oil was cut off the froth gradually died away in the spitskasten and selective action ceased.

That mineral oils in mixtures, such as defendant uses, are useful in flotation processes (and are not inert and mere diluents) is proved by the acts of plaintiffs' own licenses:

Thus plaintiffs' licensee, the Braden Copper Company, uses a mixture of 1 pound of American wood tar oil to 3 pounds of Texas oil (petroleum) per ton of ore (Tr., Vol. II., p. 284). At that place, therefore, the mixtures of oils used is precisely like that used by defendant, to-wit, one part vegetable oil to three parts of petroleum.

Again, plaintiffs' licensees at the Consolidated Arizona mine use between 2 and 3 pounds of oil to the ton of ore, about one-half of it being Carolina turpentine, and the other half fuel oil and stove oil, both of which are petroleum (Tr., Vol. VII., p. 4100). At this place, therefore, the mixture of oils used is one part vegetable oil and one part petroleum.

Furthermore, the alleged infringers in this country before they adopted the use of oil in quantity above 1% on the ore, used a mixture containing petroleum as one of its components. This was true of the Utah Copper Company at its Magna

plant, and also at its Arthur plant ; it was true of the Chino Copper Company ; and it was true of the Ray Consolidated Company.

Thus, at the Magna plant of the Utah Copper Company, when using less than 0.5% of oil, they always used a mixture of which petroleum (Jones oil) was a constituent (Tr., Vol. V., p. 2689, x-Q. 268 ; also x-Q. 281, also x-Q. 286). Since more than 1% of oil has been used, they have continued to use Jones oil as a constituent of the mixture (Tr., Vol. V., p. 2693, x-Q. 289).

Thus, the Chino Copper Company, when using less than 0.5% of oil, always used a mixture of which petroleum (Jones oil) was a constituent. Since more than 1% of oil has been used, they have continued to use Jones oil as a constituent of the mixture (Tr., Vol. V., p. 2422, x-Qs. 42 to 44).

Thus, the Ray Consolidated Company, when using less than 0.5% of oil, they always used a mixture of which petroleum (fuel oil) was a constituent. Since more than 1% of oil have been used, they have continued to use fuel oil as a constituent of the mixture (Tr., Vol. VI., p. 3244).

So, the practice of defendant in using a mixture of vegetable oil and petroleum is not peculiar to it, or to the use of quantities of oil above 1% on the ore.

But for the limited supply of vegetable oils obtainable and the high cost of such oils, defendant might use them above one per cent. on the ore, instead of using a mixture composed largely of cheap mineral oils :

The Court will obtain some idea of the great quantity of oil used in modern flotation plants from the testimony of Janney, referred to in our main brief at page 54. He states that to run the flotation plants of the Utah Copper Company alone at their full capacity, using no more than 1% of oil on the ore, would require 87,500 gallons per day, and that they should carry at least sixty days' supply on hand to be safe (Vol. V., p. 2578, Qs. 175, 176). At the same place in our brief, the testimony of other witnesses is noted showing the difficulty they are now having in obtaining enough oil even when the mixture largely consists of petroleum oil to keep their plants running using 1% of oil on the ore.

Dosenbach, defendant's witness (Vol. VI., pp. 3353 to 3356), performed in the Court below an experiment, known as "Test No. 36", in which he used with Butte and Superior ore in a Gabbett mixer 0.2% of pine-tar oil, and produced a froth which was about 1 inch in thickness. He then added more pine oil, raising the amount to 1.62% on the ore. The result was a froth which was about $1\frac{1}{2}$ inches in thickness. This last froth was analyzed and the results appear in the record (see Vol. IX., p. 5543, last line). It will be seen that whereas the original ore contained only 14.7% zinc, the concentrate contained 33.90% zinc, and while the original ore contained 67.0% gangue ("Insol."), the concentrate contained only 31.20% gangue ("Ins."). In other words, by the treatment the percentage of zinc had been raised from 14.7% to 33.90% and the percentage of gangue had been reduced from 67.0% to 31.20%. This experiment was repeated before this Court.

Hyde, in the Hyde case, described a series of tests using oil above 1% on the ore. In one test he used 32.4 pounds of oleic acid per ton, which would be a little more than 1.5% (Tr., Vol. IV., p. 1406). In another, he used as much as 72 pounds of straight cotton-seed oil per ton, which is 5.6% (Tr., Vol. IV., pp. 1406 and 1407). In both cases he obtained a highly mineralized froth and good recoveries. Samples of the ores used and a duplicate of the machine used were furnished to the plaintiffs (Vol. IV., p. 1435, x-Q. 105; also p. 1437; also pp. 1570 and 1571). The results of these tests were never questioned by plaintiffs' witnesses.

So, also, defendants' expert, Dr. Byrnes, in the Hyde case, testified to certain experiments made by him with different large quantities of oil (Vol. IV., pp. 1528 to 1530). He used more than 3.6% of cotton seed oil in one experiment; and the same amount of olive oil in another experiment; and the same amount of oleic acid in another experiment; and one-half the quantity of oleic acid (to wit, 1.8%) in another experiment. In all cases he obtained a highly mineralized froth and good recoveries.

Plaintiffs' expert Chapman testified in the Hyde case (Vol. III., p. 939, Q. 250), that he used in a plant 1.8% *straight oleic acid*, and obtained a froth recovery of 69.78% zinc, and

70.40% lead. While this is not as good a recovery as Hyde and Byrnes obtained in their slide-machine experiments above referred to, yet it was a very good result, as is indicated by the fact that the *patent in suit only claims for the present process a recovery of "about 70% to 80%"* (p. 1, line 105).

Plaintiffs' expert Higgins testified in the Hyde case that he reproduced in a plant Dr. Byrnes' experiment, using 3.6% *straight cotton-seed oil* (Vol. III., pp. 929, 930), and obtained a "copious" froth which "though oily in appearance *when closely examined*, did not differ in appearance from the usual agitation froth at a *distance of a few feet*." It is true that Higgins did not get as high recovery as did Byrnes, but that is beside the point. The point is, he admits that a mineralized froth was produced and a grade of concentrate which was 47.50% was obtained by the use of 3.6% straight cotton seed oil. Admitting that this froth was more oily than a froth produced with a small fraction of 1% of oil (as, of course, it must have been), and admitting his contention that the recovery when using 3.6% was less than when using a small fraction of 1%, the fact remains that he admits that froth concentration can be produced by using straight oils in quantities above 1% on the ore; and this fact was before the Supreme Court when it condemned as too broad claims 9, 10 and 11.

The use of oil in excess of 1% on the ore has been, since the decision of the Supreme Court in the Hyde cases, regularly used at the Magna Mill of the Utah Copper Company, as testified to by Conrads (Tr., Vol. V., p. 2655, Q. 129, *et seq.*); at the Arthur plant of the same company, as testified to by T. A. Janney (Exhibit 30, Tr., Vol. IX., p. 4992; also Tr., Vol. V., p. 2549, Q. 34, *et seq.*); by the Chino Copper Company, as testified to by Wicks (Exhibit 26, Tr., Vol. IX., p. 4987; also Tr., Vol. V., p. 2415, *et seq.*), and by the Ray Consolidated Company, as testified to by Engleman (Exhibit 44, Tr., Vol. IX., p. 5033; also, Tr., Vol. V., p. 2740, *et seq.*). In each case the mill records of the plants, both before and after the use of oil above 1% on the ore was adopted as the regular mill practice, were produced. The

facts established by this testimony, in brief, are given in the foot-note to pages 49 to 51 of our brief.

Copies of this letter have been delivered to counsel for plaintiffs-appellees.

New York, April, 1918.

Very respectfully,

THOMAS F. SHERIDAN,

FREDERICK P. FISH,

J. EDGAR BULL,

J. BRUCE KREMER,

KURNAL R. BABBITT,

Counsel for defendant-appellant.

FILED
APR 15 1918
F. D. [illegible]

HON. ERSKINE M. ROSS, WILLIAM W. MORROW AND WILLIAM H. HUNT, JUDGES OF THE CIRCUIT COURT OF APPEALS FOR THE NINTH CIRCUIT.

Minerals Separation Ltd. et al. vs. Butte & Superior Mining Company—No. 3081.

Sirs :

Counsel for appellees in the above entitled case received at their offices in New York City, late on April 3rd, 1918, from counsel for appellant, a printed document, entitled "Oral Arguments for Appellant," with the notification that the document had been forwarded for filing some time more than a week earlier. This document contains a footnote to Mr. Bull's argument, found on pages 22 and 23, and occupying nearly two pages of fine print, which footnote presents discussion and argument, and attempts in effect to present evidence, respecting certain demonstrations made before Judges Morrow and Hunt during the forenoon of Monday, March 11th.

It will be recalled that when Judges Morrow and Hunt came to the Court Room at that time to see the demonstrations there was a discussion as to what should be permitted to be done. After lengthy argument the Judges finally determined that the only demonstrations they would permit would be reproductions of those made in the Court below and described in the record, and that there should be no debate, discussion or argument whatsoever in respect thereof, and no explanations beyond references to and

reading of the record. It will be instantly perceived that the footnote in question is in direct violation of the expressed determination and explicit direction of the Judges in this respect. We respectfully submit that the footnote should be wholly disregarded, but if for any purpose the footnote is considered, then we ask that the following reply be also considered.

The footnote deals first with three of appellees' eight demonstrations and secondly with appellant's two demonstrations.

The latter (i. e., the footnote as to appellant's demonstrations) may be briefly dismissed with the statement of the fact, as to the first one, that the "pine-tar oil" employed in the Court below was not defined there or described or analyzed by any of appellant's witnesses, nor was any evidence whatsoever given as to what it was or what it contained or whether it was a straight oil or a mixture. It was for this reason that plaintiffs paid no attention to this demonstration in the Court below and gave no evidence with respect to it. It meant nothing on any issue of the case. Visual inspection shows that the "pine-tar oil" employed is not pine oil, but beyond that we have no information nor has the Court. Under these circumstances the assumption of the footnote that "pine-tar oil" is a "straight oil" of the patent is wholly without any basis in the record. On the contrary, there is every probability that it is a composite in which oil of the patent constitutes but a small fractional part. The conclusions of the footnote

“this experiment proves,” etc., and “this experiment also casts a weird light on,” etc., have therefore not the slightest foundation.

The conclusions of the footnote based on the last three of appellees’ demonstrations are equally unjustified. We will deal with them more in detail because the blunder in the observations of appellant’s counsel on which those conclusions are based might not be entirely obvious to one who is not expert in recognizing the froth of the process in suit and in distinguishing it from spurious froths.

Mr. Bull and Mr. Fish were not of counsel for defendant at the time of the trial in the Court below, and neither one of them was present at any time during the trial, and neither one of them saw any of the demonstrations that were made during the trial or heard the oral evidence as it was given respecting them, and neither one of them took part in the oral argument below. Mr. Bull’s first appearance in the case was on defendant’s brief filed several weeks after the close of the trial, and Mr. Fish’s first appearance in the case was on the brief for appellant in this Court. These gentlemen are not competent to determine from observation what is and what is not the froth of the patent in suit. Indeed, in one of appellees’ demonstrations Mr. Bull saw the froth of the patent before any oil of any kind had been introduced. It was at the beginning of the first of the three experiments of appellees’ that are discussed in the footnote. The Court will remember that Mr. Bull called attention to what he

thought was the froth of the patent, being a foam that appeared on the top after the preliminary mixing and before the addition even of the kerosene oil, and that he demanded that the operation be repeated for full observation, and only desisted when his attention was called to the fact that no oil of any kind had as yet been added. To his untrained and unaccustomed eye the metallurgically worthless foam that appeared at this time was the froth of the patent. Actual analysis in the laboratory or the determinative test of practical use in the mill at once distinguish between the real mineral-carrying froth of the patent and a spurious metallurgically useless foam, or spume, or magna. The experienced metallurgist, trained in this process in the mill, and the experienced mill man who has to do with it there, acquire remarkable skill in the recognition of the true mineral-carrying froth from its appearance to the eye and from its behavior. But to the unskilled eye of the layman the difference is not manifest and all foamy appearances look more or less alike, whether they be (1) metallurgically useless foams or froths containing both mineral and gangue together unconcentrated, or (2) metallurgically useless oil pastes or magmas inflated with air or gas, or (3) metallurgically useful mineral-carrying air froths.

As Mr. Kenyon said in oral argument to the Supreme Court in the Hyde case (pp. 89 and 90) :

“Mr. Justice McKenna: Your contention, then, is that the laboratory test is no standard?

Mr. Kenyon: Yes, sir; absolutely no standard whatever.

Mr. Justice McKenna: Do you admit that the laboratory tests show a similarity?

Mr. Kenyon: Yes. I cannot myself tell one float from another by visual observation, but the mill man will tell you the instant he tries to carry out the process in the mill. * * *

Mr. Justice McKenna: Are there any experiments on the other side showing more than the laboratory tests?

Mr. Kenyon: No, sir. They stop with laboratory tests. To-morrow you will see, but you will not know. The layman cannot tell the useful froth of the process in suit from a useless oil emulsion; whether it is a step in a real process of ore concentration or only a sham; whether it can be reproduced in the mill or not, or would treat or successfully concentrate ore. It is a situation for caution, especially as the Court below was misled by just such demonstrations."

This preceded the demonstrations that were made to the Supreme Court. Following those demonstrations the Court requested further oral argument, which was immediately had on the same day, each side being allowed a half hour for that purpose. These arguments were not recorded.

This Court in its decision in the Hyde case had said :

“The evidence in the case, together with the illustration thereof afforded by demonstrations of the various processes which were made in the aid of the argument before this Court, convince us that the froth in all these processses is the same, with the exception that there is less oil (as there must necessarily be) in the appellees’ froth than in the others. The froths are all similar in appearance, they all rise to the surface after the same amount of agitation, they all gather with equal efficiency the same quantity of metal, and all may be removed from the surface in the same way.”

The “froths” here referred to were such as this Court believed were produced according to Haynes, Everson, Schwarz, Froment, Kirby (and even as a necessary incident of Cattermole) and the process in suit.

The Supreme Court held that these fundamental findings of fact were erroneous. It seems probable that the personal observations made by the Judges themselves in this Court in the Hyde case and the similarity in appearance of all the froths exhibited were considerable factors in misleading this Court then.

Now, the only statements of Mr. Bull’s footnote that are material are the statements in each of the three cases that before the pine oil was added, and after agitation, “the Court observed that an excellent froth was produced” or

“an excellent and voluminous froth,” and that after pine oil was added “the Court observed that *the same froth* as before was produced, but its amount was somewhat increased.” What “the Court observed” is not, of course, for counsel to say. Regarding the statements, however, as statements of what counsel for appellant observed, those statements are not only wholly improper as an effort to introduce new evidence as to facts, a thing that had been explicitly forbidden beforehand by Judges Morrow and Hunt (in prescribing what should and what should not be exhibited, and what might be said and what should not be said with respect thereto), but those statements are wholly incompetent. For Mr. Bull to characterize what appeared after pine oil in each case was added as “the same froth as before” does not make it so or to the slightest degree assist the Court in reaching a just conclusion of the case. The Court below saw these particular demonstrations and many others and heard all the testimony of both sides with respect to them and with respect to the issuable fact to which they are addressed, namely, whether or not the petroleum products which constitute nine-tenths of appellant’s oil mixture will in fact, if used alone, produce the metal-carrying froth and thereby achieve the ore-concentration process of the invention in issue. The Court below also had the benefit of seeing the actual operations in the mill. The appellant as defendant in the Court below saw, through its counsel and experts, these bar-mixer demonstrations that plaintiffs made and had

its opportunity to present with respect to them whatever fact and opinion evidence it desired. The materials used in these bar-mixer experiments at the trial were divided in open court and portions delivered to appellant's counsel and experts for examination and analysis, and Mr. Higgins testified that the foamy appearances produced when the petroleum products—the kerosene and the fuel oils—were used alone, were of no metallurgical value whatever, were metallurgically useless (Vol. 8, p. 4620, Q490; p. 4614, Qs460, 461; p. 4605, Q416), and that the result of the 25% kerosene oil experiment with .1% of pine oil added and of Mr. Phillips 25% alleged kerosene oil experiment was simply an inflated paste or magma (Vol. 8, pp. 4620-4621, Qs492-496). This testimony of Mr. Higgins was neither criticized nor contradicted by the witnesses for appellant who subsequently testified in surrebuttal. As to Mr. Higgins' qualifications in recognition and appraisal of mineral-carrying froths, it is undoubtedly true that no man is better qualified, and Mr. Bull very justly said in his oral argument that Mr. Higgins "knows as much about this subject as anybody in the world" (Mr. Bull's oral argument, p. 15).

Not only is this testimony of Mr. Higgins uncontradicted, but it is *confirmed by the operations of appellant in its mill*. Appellant, in its mill operations, treating an average of more than 1,500 tons of ore a day, uses pine oil (or occasionally creosote), and evidently is compelled to do so, and cannot run its mill with the cheap petroleum

products—fuel oil and kerosene—alone (Tables defendant's exhibits 159, 160, 161, 162, Vol. 9, pp. 5186-5195; Appellees' Main Brief, p. 16, Appellees' Supplemental Brief, p. 129, and footnote). The only effect of these products upon the process is to impair it, with the resultant loss of one million dollars a year of which appellant's counsel boast.

The personal observations of Mr. Bull and his conclusions from what he saw that "the same froth" was produced by the agitation both before and after the pine oil was added, and that "an excellent froth" or "an excellent and voluminous froth" (meaning a froth of the patent) was produced by the agitation before the pine oil was added, are not only improper either as evidence or as argument, but are wholly incompetent as evidence, and they are of as little real value to the Court as Mr. Bull's discovery of the froth of the patent before any oil of any kind had been introduced.

Undoubtedly an agitation can be made so excessively fierce that even with petroleum products alone, such as fuel oil or kerosene oil or both, some kind of a foamy effect can be produced such as would have to the eye of the unskilled layman a superficial resemblance to the metal-carrying and ore-concentrating froth of the patent in suit; but the evidence is clear that such foamy appearances are worthless, because they are not the mineral-carrying, ore-concentrating froth of the patent. And the bar-mixer with a high velocity such as employed in the

demonstrations in question (9,000 to 10,000 revolutions per minute) is well adapted for that purpose.

Mr. Bull's footnote begins with a criticism of the use of a bar-mixer as affording "no fair indication of what happens in commercial machines." This criticism does not deter Mr. Bull from immediately drawing elaborate conclusions from what he asserted happened in the bar-mixer demonstrations in question, to the effect that they completely disprove appellees' fundamental contentions in the case and verify appellant's contentions.

Passing that, it is a fact, perhaps not known to Mr. Bull, that bar-mixer demonstrations were first presented by the defendant, namely, the experiments of Mr. Phillips, to which experiments and the 72 photographs (Vol. 9, pp. 5068-5138) of the alleged froths obtained from them, so much time was given in the Court below—although no mention has been made in this Court of those demonstrations and photographs. Plaintiffs in rebuttal repeated one of these experiments of Mr. Phillips in order to check his results, and to that end employed the same bar-mixer that he had employed with the same enormously high rate of speed that he had employed. This was Mr. Phillips' 25% alleged kerosene oil alleged froth experiment (photographs 18-3, 18-2, 18-1, Vol. 9, pp. 5116-5118). The experiments and testimony relating to it are treated in appellees' Supplemental Brief, pp. 209-211, wherein it appears, first, that the kerosene oil used by Mr. Phillips contained pine oil, and, second, that with eight different

specimens of kerosene bought in the open market we were unable to produce the results obtained by Mr. Phillips, but that the addition of .1% of pine oil achieved those results. Mr. Phillips' experiment with 25% of alleged kerosene was thus shown to have been spurious.

To the skilled metallurgist the bar-mixer is useful as a laboratory apparatus for the purpose of making mere observation experiments. The device is not adapted to permit clean and complete separation of the froth followed by an assay to exactly determine its metal contents. Further, it requires a skilled observer to understand and interpret what is exhibited. But as appellant had used it we deemed it advisable, if not indeed necessary, to use it for our comparative froth experiments and for the magma-producing experiment with 25% of kerosene and .1% of pine oil, these experiments being performed and explained by a skilled observer, Mr. Higgins.

Mr. Bull, in his footnote, seeks to cure a fatal weakness in appellant's case as it stands on the record in the Court below. He seeks to do this by assertions with respect to the experiments done in this Court. It was not proved in the Court below that kerosene oil alone or fuel oil alone or the two together could produce useful mineral-carrying froth. The proof was to the contrary. Relying upon his assertions as to observations of the results of experiments in this Court, Mr. Bull argues that he has now supplied the evidence and proof appellant failed to produce in the Court below, and has now overcome and disproved the evidence

and proof to the contrary which the appellees produced in the Court below. The assertions built upon these observations are utilized as if they were new evidence here submitted which proved what the defendant below utterly failed to prove and disproved what the plaintiff below unquestionably proved.

Mr. Bull's footnote draws conclusions from his observations of the bar-mixer experiments made in this Court, but these conclusions fall with the blunders of observation on which they are based. This is not a case where mere observation can determine or decide such a question of fact as that. It is a case where the Court must have the aid and assistance of those who are skilled in the special matter involved. No more striking example of the danger of following any other course could be cited than the history of the Hyde case itself. In the instant case the Court below had the benefit of the expert evidence of Mr. Higgins to guide it in determining the particular issue of fact that Mr. Bull's footnote raises, and the defendant elected to let the record stand with that testimony of Mr. Higgins unshaken by cross-examination and uncontradicted by defendant's experts who testified in surrebuttal. Moreover, the findings of fact by the Court below that the petroleum-products constituent of appellant's mixture would not, if used alone, cause the oil-coated mineral particles of the pulp to form into a froth, did not depend upon these particular bar-mixer experiments, but upon a great body of proof on that subject, supported by assays

and figures and evidence of daily experiences and results in the mills, which led the Court below to find as a matter of fact, on the testimony of witnesses on both sides, that those constituents of defendant's mixture lacked the bubble-making quality and would not upon agitation cause the oil-coated mineral particles to form into the mineral-carrying, ore-concentrating froth of the patent. This testimony is discussed in appellees' Main Brief at page 40, in appellees' Supplemental Brief at page 126, and in Mr. Kenyon's Oral Argument at page 28.

It would seem as if the whole subject of the footnote could be disposed of by one determining consideration. Did the parties reproduce exactly the experiments as they were done in the Court below? If not, then they must be entirely disregarded, because the Court avowedly was not opening the case for new proof. If these experiments were exact reproductions of what was done in the Court below, then this Court must go to the record of the experiments as done below to ascertain the proof with respect thereto.

For the convenience of the Court the summary description of appellees' demonstrations which was handed to the Court at the time of the experiments, with references to the Record, are repeated on the following page.

APPELLEES' DEMONSTRATIONS.

1. Vanning or Shaking Table Operation—Wet Concentration—no oil.

Higgins, Vol. 8, page 4467, Qs. 38-40.

2. Everson Second Method.

Higgins, Vol. 8, page 4473, Qs. 57-60.

3. Kirby Process.

Higgins, Vol. 8, pages 4503-4508, Qs. 195-218.

4. Patent in Suit and Cattermole.

Higgins, Vol. 8, pages 4747, 4748, Qs. 84-86; pages 4749, 4750, Qs. 91-100.

5. Solution Patent No. 962,678.

Higgins, Vol. 8, pages 4599-4601, Qs. 385-395.

6. Kerosene not a mineral frothing agent—addition of pine oil produces a mineral froth.

Higgins, Vol. 8, pages 4603-4605, Qs. 409-419.

7. Mixture of Jones Oil and Kerosene not a mineral frothing agent—addition of pine oil produces a mineral froth.

Higgins, Vol. 8, page 4606, Qs. 423-426; page 4611, Qs. 444-447; pages 4613-4615, Qs. 458-465.

8. 25% Kerosene oil experiment—Addition of pine oil produces an aerated magma.

Higgins, Vol. 8, pages 4619-4621, Qs. 487-496.

The oral argument of Mr. Fish as printed, when compared with the stenographer's report furnished by the Court Reporter, shows that he has practically rewritten the entire address. As printed it is in reality an additional brief submitted by Mr. Fish in place of the oral argument he made in court. Among the numerous omissions we select the following for illustration. He said:

"I do not care what else there is in the process; as a matter of fact there is not much else except the agitation to the same extent that they had in Cattermole, or a little greater—no, the same extent they had in Cattermole, for I think my brother is right in it; when the Supreme Court spoke of the agitation here as being unusual, they meant unusual as compared with Froment, as compared with Kirby, as compared with Everson; they did not mean unusual as compared with Cattermole, because the record would not justify it. I think that is right."

In his printed statement he does not include this or any paraphrase or restatement thereof. This statement should appear on page 23 of Mr. Fish's printed argument after the words, "Now, let us stop there for a moment," but it has been entirely elided.

Printed copies of this letter are this day delivered to J. Edgar Bull, Esq., of counsel for appellant, and mailed to all other counsel for appellant.

New York, N. Y., April 9, 1918.

Very respectfully,

HENRY D. WILLIAMS,
WM. HOUSTON KENYON,
LINDLEY M. GARRISON,
GARRET W. MCENERNEY,
ODELL W. MCCONNELL,
Counsel for Appellees.